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THE

VETERINARY JOURNAL.

EDITED BY

PRINCIPAL WILLIAMS, F.R.C.V.S., F.R.S.E.,

AND

PROFESSOR W. OWEN WILLIAMS, F.R.C.V.S., F.R.S.E.

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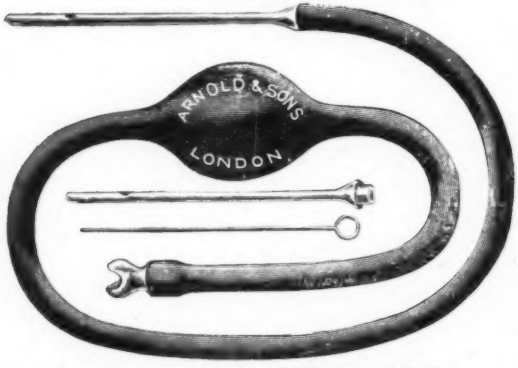

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THE

VETERINARY JOURNAL

JANUARY 1900.

Editorial.

OUR NEW YEAR SALUTATION.

IN commencing this, the sixth year of our editorship of THE VETERINARY JOURNAL, we find ourselves, through the courtesy and enterprise of our publishers, in a position to address a very wide audience. Not only have we our regular readers, the faithful body who have followed our fortunes in the past and cheered us with their encouraging support, but we have the honour of addressing every registered veterinary surgeon in the United Kingdom, the British Colonies, and in America, to each and all of whom a copy of our present issue is being sent. Such an honour does not often come to veterinary editors, and we wish to avail ourselves of it to the utmost extent. In so doing we hope not only to extend the circulation of the Journal—which would be in itself a source of great pride and satisfaction to editors and publishers—but we desire mainly to help towards the federation of the profession. We are a comparatively small profession as yet, and our voice is not very loud and it is seldom heard, but we have the possibilities of a great future, we are destined for important work; only we must gird up our loins, and that quickly, if we wish to accomplish that work and rise to the high position which we hope and believe we deserve.

We trust that when our January issue comes into the hands of new readers they will pass it on to some friend interested in veterinary affairs, and likely to become a subscriber, or that they will send it abroad. In these days, when Imperial Federation is the watchword of the British citizen, and when every man and woman in the country has a more or less profound interest in our Colonial Empire, when every one of us has a brother or nephew or cousin in the lands beyond the sea, it ought not to be difficult to find eager readers for our Journal in the Colonies—men and

women who will be only too pleased to learn that there are journals devoted to the things that interest them. Postage is cheap now, and therefore we trust that each recipient of the January number will sacrifice a penny or two and so aid us in spreading abroad the light of science. Our own labour throughout the year is largely a labour of love; if we had no regard for scientific truth and no desire to help those who are in need of help, if we were influenced by purely mercenary considerations, we should be grievously disappointed at the balancing of our yearly accounts. But there is a charm in coming every month into contact, even through the dead symbols of print and paper, with our fellow-men, and one cannot help feeling a thrill when one thinks that one's words may be read by thousands of readers. And this, we maintain, is apart altogether from financial considerations. Let our readers, the old and the new, share this pleasant feeling. Let them send us from time to time notes of interesting cases that come under their notice, or let them give utterance to their thoughts on any subject that concerns the veterinary profession. We shall be pleased to receive and consider all such communications, and to find a corner for them in the Journal, if we can. Nothing is more gratifying to us as practitioners than to have a quiet talk with a professional brother, however young or however old, whether living in a remote village or a huge centre of population. They all talk in an interesting way: why don't they write to us? Some of our countrymen in far-away places may say that their grammar has become rather irregular, or that they have forgotten the scientific terms which they learned at college, or they may simply urge want of time for the preparation of papers in journalistic form. That need not be a deterrent. What we want is important cases: we will, if necessary, attend to the form ourselves, and see that full justice is done to our contributors.

The British Empire is at present passing through one of its periodic crises, but these crises always bring about a sharpening of our intellectual powers, and they result in a strengthening of the bonds of brotherhood and a higher appreciation of the solidarity of the race. We fervently pray that when the gloomy war-cloud has rolled away from us we may find, as compensation for our losses and bereavements, that our brothers across the seas have become more closely knit to us than before, and that the symbol of this extended brotherhood is the wider circulation of THE VETERINARY JOURNAL.

THE OUTLOOK FOR 1900.

THE most important question for the year that is beginning is without doubt that of meat inspection, and the position of the veterinary surgeon with regard thereto. We have harped upon this string several times already in the course of the year that is past, but some of our professional brethren—and these not the least influential—remain persistently deaf to our charming. Can they be like the deaf adder that stoppeth her ears and will not listen to the voice of the charmer, charm he never so wisely? We do not claim to possess magic power, but we do aspire to the possession of common-sense and to a fair measure of consistency, but we cannot admit that all our neighbours and contemporaries are endowed even to this humble extent. As an example of how not to do it, we must again take the *Veterinary Record*. Our readers will remember the old fable which told us of the rage and fury of the satyr when he found a chance guest first using his breath to warm his hands and afterwards for the purpose of cooling his porridge. This old story seems to be a metaphor which admits of constant application. Let us hear the *Record* first arguing on our side:—"That an enormous quantity of diseased and putrid meat is consumed is certain, and to an audience of veterinary surgeons it is quite unnecessary to argue the necessity of inspection. Our special duty seems to be to lose no opportunity of insisting upon its importance to the general public, at the same time that we carefully assert our claim to be the only body of men who are so trained and educated that we can perform the duties of inspection with justice to the consumer and the purveyor. The proper inspection of meat requires that, whilst the consumer is protected from danger, no injustice should be done to the butcher; and a further requirement is that the ratepayers should be put to no costs which are unnecessary for the protection of public health. A scheme of logical perfection can never be attained all at once in a constitutionally governed country like our own. Practical convenience and vested interests are always to be considered, and the process of reaching the best methods is a gradual one, accompanied by compromise at every step. The existing laws provide that the inspection of meat and the seizure of such as is unfit for human food shall be entrusted to the Medical Officers of Health and the Sanitary Inspector. The Public Health (Scotland) Act, 1897, specially provides that the meat inspection may be performed by 'a veterinary surgeon approved for the purposes of this section.' When a County Council or a Corporation are owners of an abattoir, they may appoint any one they please to carry out the regulations of the place. In some few large towns the authorities have put the meat inspection into the hands of veterinary surgeons. Edinburgh has taken a leading position in this intelligent form of inspection, and a member of our profession may be mentioned as

the pioneer to whom the chief credit belongs. The late Professor Walley must always be remembered as the prominent authority who first in this country made meat inspection a science and an art. Manchester deserves notice as one of the first English towns to recognise the necessity of appointing a veterinarian as meat inspector. The eredit of initiating this advance is certainly chiefly due to Mr. Sam Locke, M.R.C.V.S., who, as a member of the City Council, converted his colleagues to the view that only special training such as veterinary surgeons possess can render a man really efficient for meat inspection. A few other towns have abattoirs, and gradually the authorities are placing the inspection of these in the hands of veterinary officers."

Next we have an important piece of information, which some of our colonial readers may not have seen :—" In 1898 a report was issued by a Royal Commission appointed to enquire into 'the administrative procedures for controlling danger to man through the use as food of the meat and milk of tuberculous animals.' No legislation of any practical value has yet followed this report, but recommendations of the Commission are a valuable help to the consideration of the general subject of meat inspection. These recommendations would probably exert great influence upon any legislation which might be attempted, and they distinctly show the the impression made upon the minds of the members of the Commission by the evidence given by representatives of all the interests concerned with meat inspection, The salient points of this report should therefore be kept in mind."

After this the *Record* begins to tack about in order to support its pet scheme, the Sanitary Institute, which body has stepped into the privilege of granting certificates to candidates for meat inspectorships. The Institute primarily existed for the purpose of examining sanitary inspectors, a very useful body of men, but presumably a body without any scientific training and without the mental discipline necessary in all those who desire to understand scientific matters and administer laws based thereon. Of course the Institute at once found itself in a difficulty. It recognised, says the *Record*, the technical character of the work and called in to its aid members of the meat trades and of the veterinary profession. What help the meat trade people could give in deciding as to the qualifications of men aspiring to a knowledge of the names and situations of the organs of the body, the signs of health and disease in animals, and the appearance and character of organs, fat and blood, and the conditions rendering them fit for human food, we entirely fail to see. There are such things as happy inspirations and lucky guesses, and there are certain rules of thumb which sometimes enable empirics to take the right course, but why we should trust ourserves to empirics (or quacks, as the vulgar call them) when there is a reasonable supply of scientifically trained men, we do not understand. Such action on the part of a Govern-

ment institution is neither fair nor honourable treatment either of the veterinary profession or of the confiding public. How a distinguished member of our profession can argue in its favour—or, shall we say, put forward sophistical arguments in its support—is nothing less than amazing. There must have been great uncertainty at the meetings of the Board and much searching of hearts. We doubt very much whether the representatives of the medical profession or those nondescript and hybrid persons whom the *Record* calls "general sanitarians" did much to relieve the darkness and gloom. Perhaps they are in a quandary. "No certificates have so far been granted, as the first examinations have yet to be held." This is fortunate and gives us room for hope. Writing on Christmas Eve we have resolved to eat our roast beef to-morrow with a tranquil mind. Next year, who knows, we may feel it necessary to tell the wife of our bosom that she must confine her culinary purchases to sago and arrow-root, with perhaps a carrot or two to give the thing a flavour. "The regulations adopted," the *Record* continues, "are not final (we may have one or two more roasts in January!), and I have no doubt that any suggestions offered to the Institute by a body possessing knowledge of the subject would be considered with respect." We need not, therefore, yet say with the French king, "All is lost save honour."

The *Record* gives some valuable information as to the recommendations of the Commission on the qualifications of the new inspectors, to which we have referred above. In their recommendations they (the Royal Commission) state in some detail what they consider the qualifications of a meat inspector should be. This is the paragraph—

"QUALIFICATIONS OF MEAT INSPECTOR.

"We recommend that in future no person be permitted to act as a meat inspector until he has passed a qualifying examination before such authority as may be prescribed by the Local Government Board or Board of Agriculture on the following subjects:—

"(*a*) The law of meat inspection and such bye-laws, regulations, &c., as may be in force at the time he presents himself for examination.
"(*b*) The names and situations of the organs of the body.
"(*c*) Signs of health and disease in animals destined for food, both when alive and after slaughter.
"(*d*) The appearance and character of fresh meat organs, fat and blood, and the conditions rendering them, or preparations from them, fit or unfit for human food."

Then we get information as to qualifications proposed by the Institute.

" The qualifications rendering candidates eligible for examination are :—

" (1) Proof of three months' practical work.
" (2) Possession of a certificate as sanitary inspector.
" (3) An age limit of 21 years.
" The examination is in two parts, written and oral.
" The subjects taken are those suggested by the Royal Commission.
" The oral part is to be conducted with specimens."

The remarks of the editor on the proposed regulations can scarcely be dignified with the name of special pleading. They are—we say it with regret—little short of quibbling. He goes on to say, somewhat irrelevantly and ungrammatically,—" Never yet has such anxiety been displayed by a medical man as to show jealousy and fear of the sanitary inspector; such an exhibition of weakness has been reserved for the veterinarians." The answer to this is—We don't fear this inspector, we simply despise him, so does the medical officer, but we resent his intrusion on our territory, believing him to be little less than an impostor. Our friend the editor (who is a delightfully humorous—unconsciously humorous—embodiment of dear old John Bunyan's Mr. Facing-both-ways), proceeds to argue: " If the examination (for the diploma of the Institute) is any good, it can only be passed by veterinary surgeons; if any inferior person passes, it must be a farce or a fraud." This is wholesale condemnation in advance; it almost amounts to a threat to the Institute, and may lead the editor, who is what we call in Scotland a " ruling elder " of the Institute, into a fearful dilemma some day. We suggest a simple escape; why not say boldly, only veterinary surgeons are available for meat inspectorships?

The editor flounders on—" Meat inspection does not exhaust the whole knowledge of a veterinary surgon." We sincerely hope it does not; it is merely a part of it, but it is a corollary of his other knowledge, just as we say the greater includes the less. But then the editor of the *Record* goes on to say, " It is humanly possible that a man might be a good meat inspector but not a good veterinary surgeon." Of course, of course, but why gabble on about mere possibilities which are seldom realised? There are heaven-born soldiers, and we hear sometimes of gifted labourers, and so forth, but the War Office does not look for its supplies of officers from the civilian class, nor our publishers from the labouring classes. " It is possible that an examination for meat inspectors might rightly reject a veterinary surgeon." Quite true, just as many an unhappy student has been plucked by the examiners of the Royal College of Veterinary Surgeons for insufficient knowledge of his anatomy or physiology. Don't we know them!

" The meat inspector's certificate of the Sanitary Institute

makes no pretence to compete either with a medical or a veterinary diploma." We say it does. If only veterinary surgeons are competent to become inspectors, this new certificate is an intrusion and an impertinence, as certifying what has been already certified. If other men than veterinary surgeons, or the failures in our veterinary schools, can scrape through the examination of the Institute, we find ourselves confronted with a low-level certificate which is bound to injure us professionally. The editor of the *Record* is haunted by this terror, and takes refuge in sophistries as before. He is reduced to such arguments as "a little lower than the best is found to give practical satisfaction. What does this mean but the deliberate intention to introduce an inferior certificate? This argument, or sophistry, is bolstered up by a pitiable appeal to the pocket of the British householder, a quotation from the horrible gospel of cheapness.

We have not quite lost all hope in the *Record*, and we finish our somewhat pessimistic editorial by giving a really manly quotation from our contemporary:—"On the general question of meat inspection and meat inspectors, I hold as strongly as any of us that inspection is a necessity, and that the best inspector is a veterinary surgeon. To attain the positions we claim, our methods should be to bring constant influence to bear upon Local Authorities having appointments to make, and to watch carefully the legislation which is wanted to regulate the whole subject,—legislation which cannot be much longer delayed."

Lest our readers should think we have garbled the *Record* editorial, we refer them to its issue of 16th December, which all veterinarians might read with profit. Our views are quite clear and simple. Meat inspectorships are the appanage of the veterinary surgeon, whose whole training has prepared him for them; details required by the authorities can easily be grafted on his present curriculum of study, and can, if necessary, be specially tested; sanitary inspectorships ought not to be forced on the veterinary meat inspector, but he might be left free to accept them in addition to his other work, if he likes. In a word, the veterinary meat inspector may become an amateur sanitary inspector; a sanitary inspector must not be allowed to blossom out into a quack meat inspector.

INJURIES AND TUBERCULOSIS.

MESSRS. LANNELONGUE and ACHARD have made known the results of a series of experiments, consisting in inoculating animals with tuberculosis through different channels (subcutaneous cellular tissues, peritoneum, the trachea, the blood), then producing in them a wound at a period varying according to the infection. In many cases it is in the neighbourhood of the point of inoculation

that the wound has taken effect. Now all these animals died of tuberculosis at varying periods, one only eight days after appearance of the wound, four in the course of the first two months, the others later still, even up to 232 days after the wound appeared; but not one of them showed any tuberculous lesions at the point of the injured regions. Messrs. Lannelongue and Achard found nothing at these points but traces, more or less apparent, of injury in the form of luxations, thickenings arising from fractures and deformation of the limbs. They registered a negative result in the case of two guinea-pigs infected by injecting the culture of human tuberculosis in the peritoneum. The one which had developed a wound seventeen days after inoculation died twenty-six days later, the other, in which the injury occurred at the time of the inoculation, survived forty-three days,—intervals which should have sufficed to let the tuberculous lesions become recognisable. No better result took place in the case of two guinea-pigs inoculated in the trachea; they developed the injury at once, and died 120 and 140 days later.

Finally, in order to obtain the conditions most favourable to the localisation of tubercular bacilli, the two experimenters injected direct into the right heart of six guinea-pigs very feeble quantities of tubercular bacilli, causing these animals to be wounded immediately. These succumbed at intervals of 15 to 106 days to lesions of generalised tuberculosis. At the autopsy there was found no appearance at the seat of the wound of tuberculous lesion. The results of the experiments agree, therefore, with those of clinical observation. The conclusion is that tuberculosis does not act identically with other infections, notably with severe suppurations. It is not so easy as one would think, and as has been stated everywhere, to localise tuberculous processes in a wound-focus. Another result may perhaps be drawn from these experimental facts,—that is, the rarity of blood-infections in tuberculous animals.

(*Ann. de l'Institut Pasteur*, 1899.)

POWERS IN REGARD TO TUBERCULOUS MILK.

WE are anxious to learn how many veterinary surgeons in this country have been appointed by Local Authorities to examine milk-giving cows, for the purpose of discovering which of them have tuberculosis of the udder.

Every Local Authority now has the power to have *every* milk-giving cow in its district examined by a veterinary surgeon; and if he should report that any cow has tuberculosis of the udder, it is then in the power of the Local Authority to prohibit the sale of its milk, either mixed with other milk or alone, for human consump-

tion; furthermore, such milk cannot be used as food for other animals unless previously boiled.

By the passing of this Order a very grave responsibility is now placed on the various Local Authorities of the country, and we presume that the Medical Officer of Health in each district will insist upon his Local Authority doing its duty, otherwise all cases of tabes mesenterica and scrofula will undoubtedly be laid at the door of the negligent authorities. We wish, however, that the Local Government Board had gone a step further, and prohibited the use of such milk in the manufacture of butter, cheese, ice creams, and all other substances which contain milk in an uncooked state. But even with its faults, this Order, if properly carried out, should at once cause a considerable diminution in infantile mortality.

We sincerely trust that every Medical Officer of Health, and every Local Authority veterinary adviser will urge upon their authorities the importance of this matter. The Order states that Local Authorities must have "approved" veterinary surgeons to decide as to whether or not a cow has tuberculosis of the udder, and that the Inspector of Dairies may render assistance under the direction of the veterinary surgeon.

It would thus seem that an Inspector of Dairies in a district shall, after receiving certain instructions from the "approved" veterinary surgeon, report to him on all suspicious cases, and then that he (the A.V.S.) shall proceed to make such examination as he *shall deem necessary* to ascertain whether or not the udder is diseased. Nothing could be better, and we trust ere long to hear that the percentage of cows with tubercular udders is reduced to *nil.*

ROYAL COLLEGE OF VETERINARY SURGEONS.

CHRISTMAS examination of students at the New Veterinary College:—

The following passed the "*A*" *Examination.*—Messrs. R. Mairs, J. H. Nicolson, J. A. Shaw.

"*B*" *Examination.*—Messrs. R. Finch, L. Lloyd, A. B. Mattinson, and H. Sanderson (2d Class Honours).

"*C*" (*Four years'*) *Examination.*—Messrs J. Bradley, S. C. Binks, R. Scott, and J. Stafford.

"*C*" (*Three years'*) *Oral Examination.*—Messrs. R. H. Connochie, Selkirk, and J. S. Drabble.

"*C*" (*Three years'*) *Practical Examination.*—Messrs. R. H. Connochie and Sydney Robson, Pontefract, admitted Members of the Royal College of Veterinary Surgeons.

"*D*" *Examination.*—Messrs. J. S. Foley, Kilrush, and G. A. Harrison, Bradford, admitted Members of the Royal College of Veterinary Surgeons.

The Council of the Victoria Veterinary Benevolent Fund are anxious to increase their capital to at least £1000.

The Fund is doing splendid work—many calls are made upon its funds. Already £60 a year has been voted in relief. This cannot continue unless members of the profession subscribe to the Fund.

Come now, gentlemen all, and send something towards the aid of the widows and families of your brethren who were not so successful as most of you are. "Ever so little will help."

Subscriptions should be sent to W. F. BARRETT, Esq., 46 Lewisham High Road, New Cross, London, E.C., who acts as Honorary Secretary and Treasurer.

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

A MEETING of the Scottish Metropolitan Veterinary Medical Society was held on Wednesday afternoon, 29th November, in the Clarendon Hotel, Edinburgh, and on the motion of the Hon. Secretary (Mr. Peter Moir), seconded by Mr. Durkie, Dundee, Mr. Inglis was re-elected President of the Society; Professor M'Lachlan Young, Aberdeen University, Mr. Aitken, Jun., Dalkeith, and Mr. Connochie, Jun., Ayton, were elected Vice-Presidents; and Mr. Peter Moir was unanimously re-elected Hon. Secretary.

THE SOCIETY'S PROCEEDINGS.

Mr. PETER MOIR gave an account of the Society's proceedings for the past eleven years. He explained that at an informal meeting held on February 22, 1888, Messrs. Borthwick, Sen., Connochie, Sen., Hutton, Boyd, Aitken, Jun., Cunningham, Durkie, Rutherford, Principal Williams, Professor Williams, and Professor Lewis met at the London Hotel, and unanimously agreed to form a Veterinary Society—the Scottish Metropolitan—and accordingly the first regular meeting was convened on March 7, 1888. The office-bearers were then appointed as follows:—President, Mr. C. Cunningham; Vice-Presidents, Principal Williams, Mr. John Bothwell, and Mr Connochie, Sen., Selkirk; Secretary and Treasurer, Mr. Rutherford. Mr. Storie read a paper on "The Measures to be adopted for the eradication of Bovine Tuberculosis," and Mr. Thompson on "Veterinary Obstetrics." At a meeting on June 26th a memorial was drawn up memorialising the Government (1) to stop the sale of milk from tubercular animals; (2) that only veterinary surgeons be employed as meat inspectors, and that they should decide what flesh should be passed as fit for food; (3) to give compensation for animals condemned as being affected with tuberculosis. At that meeting also a paper on "The use and abuse of Cake as a Feeding Stuff for Cattle and Sheep" was read by Mr. Hutton, Kelso. At the first meeting in 1890 Mr Henry Thompson, President, in his address expatiated on "Tuberculosis and Inoculation for Pleuro-Pneumonia." The subject of Dishorning of Cattle, which was then

a burning question, was brought forward by Mr. Clark, Coupar-Angus, and at the meeting and dinner that followed elicited expressions of approval of the practice from several of the leading agriculturists and salesmen of that day, including the late Mr. Thomas Swan. At the meeting of June 1890—Mr. Thompson in the chair—Rabies in Dogs was discussed by the members, following a request from the Central Veterinary Medical Society, London, for our opinion on the resolutions drawn up by them, which referred to the value of effective muzzling for no less period than six months, &c. On Friday, August 22, 1890, a special meeting was held for considering the new Act for pleuro-pneumonia, and the position of veterinary inspectors and the profession generally as affected by its provisions. There was a large gathering of veterinary surgeons, the largest from the formation of the Society up to the present time. The travelling inspectors and the packing up of lungs to forward to London were the leading clauses discussed, and copies of the resolutions arrived at were sent to Mr. Chaplin, Minister of Agriculture. A very gracious reply was returned from the President of the Board of Agriculture. At a meeting on 25th February 1891—Mr. Clarke, President—it was resolved that the summer meetings be held at a large agricultural centre, commencing for that year at Perth. A paper on Swine Fever was read by Professor Bowhill, and there was the Presidential address. In June 1891 the meeting was held at Perth. A paper on Pink-Eye was read by Professor Williams, Sen., strongly condemning the use of blisters and the administering of alcoholic stimulants. A lively discussion followed. On 11th November 1891 ten new members were elected. A paper on "Animal Parasites," by Professor de Jong, was read, and discussion took place on the proposed new charter, relative principally to the election to the Council of Members who were not Fellows, and the abolition of the dual appointment of Councillor and Examiner. On 17th February 1892 the chief features were a paper and lime-light demonstration of the differences between the pleuro-pneumonia existing in this country and the so-called pleuro-pneumonia of Canadian cattle. On July 4th, the summer meeting was held in Dundee. A paper on "Grass Disease in Cattle" was read by Mr. Clark; and the meeting discussed also the education question and extension of the curriculum. On 23d November there was another discussion arising from the condemnation of Canadian cattle in Fife for pleuro-pneumonia by Government officials, one bullock slaughtered at Lindores being considered affected. At the summer meeting in 1893, held at Perth, a paper was read by Professor M'Lachlan Young on "Bacteriology, with special reference to Anthrax." At the November meeting—Professor W. O. Williams, President—a paper on "Flatulent Colic" was read by Professor O. C. Bradley. On March 14, 1894, there was a discussion on Cruelty to Animals and its Prevention; also in regard to the Government Grant to Ireland to promote the education of Veterinary Science, leaving Scotland and England in neglect. At the 1894 summer meeting in Glasgow, Professor James Hunter read a paper on "Ventilation and Drainage," and Mr. Thompson, Aspatria, a paper on "Anthrax." In November 1894 Professor M'Dougall, D.Sc., read a paper on the "Lathyrus Saturis," the mutter pea. In 1895 Mr. John Cameron was President, and the summer meeting was held at Berwick-on-Tweed, when Tuberculosis was the principal topic, and a memorial was sent to the Royal College of Veterinary Surgeons for transmission. In November 1895 the Society discussed a memorial by the Lincolnshire Veterinary Medical Society on

Grunting as an unsoundness, and the proposed Notification of Diseases Act was not approved. Mr. Boyd reported most favourably on the tuberculin test. In February 1896 there was a ballot for a Scotch Member of Council of the Royal College, and Mr. Cunningham was chosen. A paper on "Cryptorchid Castration" was read by Mr. Inglis, Forfar. Affiliation of Society with the National was discussed, and decided in the negative. In July 1896 the summer meeting was held at Melrose. A trip took place to Lord Polwarth's estate at Mertoun. The Summer College Session was discussed, and a paper on "Septicæmia in Cows following Parturition" was read by Mr. Boyd; Rontgen Ray demonstration by Professor Paton, Cirencester. In December 1896 Principal Williams spoke on his visit to Jamaica, and there was a lime-light demonstration of Pathogenic and other organisms by Professor Bradley, besides a discussion on Anti-Tetanic and Iodine for Purpura. At the February meeting in 1897 the Public Health (Scotland) Bill was discussed, and a protest against clause 57 as unfair to the Veterinary profession forwarded to Royal College of Veterinary Surgeons for the House of Commons Committee. There was also a lime-light demonstration of Louping-Ill Organism and Cultures; Life-history by Principal Williams. At the summer meeting in Aberdeen the Society met many members of the North of Scotland Society, who were very kind. There were demonstrations by Principal Williams connected with Louping-Ill and Jamaica Cattle Plague, and lecture from Dr. Matthew Hay, and the members were conducted by Professor Hamilton through laboratory. In November 1897 a paper on "Tuberculosis: its Hereditary Nature" was read by Professor M'Lachlan Young. In 1898 the Society heard Mr. W. R. Davis' experiences in Basutoland of Rinderpest, and discussion on Professor Young's paper. At the summer meeting in Kelso Tuberculosis was discussed with special reference to compensation. In November 1898 "Docking" and notes by the way. After briefly indicating the principal topics discussed during the present year, Mr. Moir said he had gone through the transactions of the Society in order to draw attention to the variety and important character of the work that the Society carried on on national questions affecting the interests of the profession. Their Society and similar Societies formed a mouthpiece of the ideas of the members of the profession scattered all over the country. Ever since its institution this Society had been pointing out the dangers from the milking of tuberculous cows, and giving milk to children particularly from such cows. Twice resolutions had been drawn up and forwarded to the Board of Agriculture, drawing attention to the dangers arising from the use of the milk and flesh of tubercular cattle. They could also claim having done some good for the profession. If it had not been for this Society and the sister Society in the west, the profession would have been ignored in the Public Health (Scotland) Act so far as regarded the inspection of cattle and dairies in municipalities. Owing to the action of the two Societies, clause 57 was altered in the House of Commons only a very few days before the Bill became law. Notwithstanding these facts, he regretted to say that there was still a deplorable amount of apathy in the profession in regard to making this and other Societies the mouthpiece of the profession. Such a Society became a focus on any important question, not only affecting the personal interest of the veterinary surgeon, but affecting the interests of the nation at large.

Professor W. Owen Williams then opened a discussion on meat inspection as follows :—

The importance of this subject, "The Inspection of Meat," was brought prominently before the general public, when they heard that the soldiers of the American nation during the recent war were being offered what was called "embalmed" beef—in other words, meat that was unfit for food. We as a nation sympathised, and held up our hands in horror at the thought of such a dreadful thing. Of course we never dreamt that such a thing could occur with our soldiers, but listen to this :—

From the TIMES *of November* 16.

"Sir—The transport 'Arawa' was supposed to leave Southampton on Tuesday last with the Shropshire Light Infantry for South Africa. Some of the newspapers on Wednesday morning stated that the ship had sailed on the previous day as arranged, others that she had been detained by a fault in her electric apparatus, and would leave early on Wednesday morning. There may have been something wrong with the electric light on the ship, but there was something much more incurably wrong with the supply of meat put on board, for, being on the ship on Tuesday at the time when she was due to sail, I saw great piles of meat—legs and sides of beef, and whole carcases of mutton—brought out from the storage room and deposited on the wharf. The whole consignment of meat, I believe, was condemned as unfit for food, put in a barge, towed out to sea, and thrown overboard.

"While the meat was being unshipped the firemen struck work. Whether the language they used was any evidence of the justice of their complaint is more than I can say, but I heard several of them loudly declare that they would take half the money owing to them to be quit of the ship. Finally they were marched off under an escort of police, and presumably this ship has now sailed not only with a fresh supply of meat, but also with a fresh crew on board. When she left the docks, nobody—certainly no newspaper that I have seen—seems to know, but I am informed that by midday to-day she had got as far as Netley Hospital, 2 miles distant from Southampton."—I am, T. THISTLE."

"ELING, *November* 10."

Here is an extract from the letter of an officer on board the "Nubia" :—

". . . We're in the Bay of Biscay now, and very calm, for a wonder. . . . On Wednesday I've got to be inoculated against typhoid and diphtheria. A leech attacks you with a sharp pin and gouges a hole in your side and injects the dread virus, and then you are devilish ill for two days. Sounds pleasant! . . . We are jolly 'comfy' on board this 'Nubia,' but the poor men are 200 too thick, owing to some genius at the War Office sending 200 too many. . . . To-day every soldier—1600—on board the 'Nubia' complained to the officers of their companies that their dinners at 11.30 of salted beef were putrid. The Colonel, Arthur Paget, with the doctors, quartermasters, naval transport officer, purser, and the captain of the ship, inspected the messes and condemned the foul carrion as being unfit for human food. Sixteen men are allowed 12 lbs.; on weighing it 12 lbs. weighed in many cases only 3 lbs., at most under 6 lbs. Fancy sixteen hungry men sharing 3 lbs., including infernal great brisket bones! The whole rations were thrown overboard by order of the

O.C. troops. . . . This carrion is never eaten by any English soldier; so fancy the waste of the public money. . . ."

Now, who is to blame for this? I say without hesitation it is our Government. It should make absolutely certain that unsound meat could not possibly be put on board our ships. Complaints at present are few, but we must remember that we are getting little news of anything except the mere arrival of the transports. We have heard nothing about their passage out. Complaints have already come to hand of the commissariat in the Indian transports. It is a curious thing that when the steamships do all the commissariat for the soldiers no complaints have as yet been made; but when the Admiralty do it, then complaints are made. Is the Admiralty meat inspected, and by whom? It is generally accepted that the maintenance of health is due to the breathing of pure air, the drinking of good water, and the eating of wholesome food. This holds good as much with the lower animals as with man, and if due attention be not paid to the proper feeding and environments of the lower animals, how is it possible to supply man with wholesome food. Britons, who in the eyes of the rest of the world are the most fastidious about their own bodily cleanliness and health, are the last to recognise that similar conditions should prevail for the benefit of the lower animals. In France, Germany, Austria, Denmark, Sweden, Russia, and in the United States of America, provision is made that all care shall be taken of the health of the lower animals, but who seems to bother in this country as to the hygienic surroundings and feeding, say, of our pigs and fowls? Any garbage is good enough for them, and we enjoy our bacon and eggs to breakfast in the morning without a thought of from where they were obtained. We allow our cows in the country to drink the water from the horse-pond, where it has been fouled by all the animals on the farm, and yet we complacently drink their milk, and expect to get strong and healthy on it. Sanitary science is making rapid progress in this country, but we are still far behind many other countries, inasmuch as we neglect the lower animals. I wonder how many of our high-born ladies would stand the smell of an ordinary town stable, cow byre, or piggery; even strong men are often turned sick by the odours which come from these places. As long as this state of things lasts, how can we expect to have healthy animals or to obtain from them healthy food? For many years the veterinary profession has been trying to inculcate some notions of cleanliness into the minds of owners of lower animals with varying success, but the time of gentle suasion has now elapsed, and it is necessary that the public take the matter in hand, and insist that as much attention shall be paid to the healthy surroundings and feeding of the lower animals as shall ensure it obtaining food which is untainted and good. Unfortunately the Government of this country has made no attempt to grapple with this subject. No doubt powers have been given by the Local Government Board to County Councils to make regulations as to the cubic space per cow. Powers have also been given to prevent the sale of actually diseased meat, and of milk contaminated with the germs of tuberculosis, and of diphtheria, scarlet, and other fevers of man. Again, the last Royal Commission on Tuberculosis recommended that all meat should be inspected, and that the inspection should be done by trained men; but all these disjointed orders and regulations will have little effect on the mass. This country at present possesses a most efficient body of Medical Officers of Health, who, to assist them,

have large staffs of sanitary inspectors. These medical officers' duties are to keep the people in health. Now, I am of opinion that only second in importance to that, is the keeping of the lower animals in health, and by so doing assist the medical officers in their work. This can only be done by the Government forming a proper department, to be known as the Health Veterinary Department; and the duties of that department should be to see that all the lower animals—horses, cattle, sheep, pigs, dogs, cats, and fowls—are kept in proper sanitary places. I need not dilate here to you upon the picture which floats before my mind; of the loathsome stables, even in Edinburgh; of the foul-smelling piggery not much further away; you know what many of these places are like. Further, it should see that the food and water supply should be good, and in the case of cattle, sheep, pigs, and fowls, should inspect the carcases prior to their being exposed to the public for sale. Now, what men are to do all this? This kind of work cannot be done by various bodies of men—one bit by one body of men, and another bit by another body. The work must be done by men trained in all branches of the subject. There must be no special body of men to inspect under the Contagious Diseases (Animals) Act, and another to inspect under the probable new Act—(the Tuberculosis Animals Act)—and yet another to inspect live animals, and another to inspect dead animals. The matter must be dealt with as a whole, and not in parts. An attempt of this subdivision is now being made by the Sanitary Institute, which proposes giving Sanitary Inspectors after a two months' course a certificate, certifying that the holder knows all about animals in health and disease, prior to and after death; and furthermore, that the certificate-holder is qualified to use tuberculin, mallein, and such-like dangerous substances in proving whether live animals are healthy or diseased. Still further, he will be entitled to give an authoritative opinion as to the fitness or otherwise of animal flesh for human consumption. Was anything ever more ridiculous? Why, even an M.D., after all his university education, requires to undergo a special training in meat inspection before he can give such an opinion. Who, then, are the men to whom this work should be entrusted? The veterinary profession is the only body of men from which such men can be drawn. Remember, I don't say for one minute that every veterinary surgeon is fit to be an inspector. There are many men who have completely dropped that portion of their work, and are devoting themselves, we will say, to pure surgery, or to consultation work; but it is only men who have had a thorough training, and have qualified as veterinary surgeons, who *can be* fitted for these duties. Just glance over the list of subjects which the student of the present has to study for four years, and is examined upon before he can obtain his diploma:—chemistry, botany, anatomy of all the domesticated animals, physiology, stable and byre management, hygiene, meat inspection, pathology, medicine, and surgery. The student is examined on all these subjects, and on many minor ones as well. He must have a thorough practical knowledge of signs of disease in the lower animal during life and after death, and must be thoroughly conversant with the means of suppressing epizootics, and preventing their spread. What other body of men is there who have such a fitting education for the purposes I mention? I would also like to bring before your notice the resolutions of the Seventh International Congress of Veterinary Surgeons held at Baden-Baden. There were several thousands

of veterinary surgeons from various parts of the world present at this Congress, which is the most important is connection with the profession. The Congress declared that "none other than certificated veterinary surgeons can be summoned as professional men to inspect meat. Only veterinary surgeons should be appointed as professional inspectors of meat, and as the directors of slaughter-houses and cattle-sheds." I may say that in the colleges in Scotland—at the one in Glasgow, and the two in Edinburgh—for the last twenty years instruction in meat inspection has been made a specialty of teaching. Students for all these years have been taken regularly to the slaughter-houses and given a thorough course of meat inspection. I am sorry to say that the veterinary students in London have not the same opportunity as in Glasgow and Edinburgh, as they have no public slaughter-house. Next week there will be a meeting of the Central Veterinary Medical Society in England to discuss the same question. At a meeting of the Council of the Royal College of Veterinary Surgeons, it was decided that a deputation should call upon the Local Government Board and the Board of Agriculture, and urge upon them the necessity of appointing none but veterinary surgeons as meat inspectors. The opinion of the profession is that meat inspection can only be carried out by thoroughly qualified men, and the only qualified men are those who have obtained the diploma of the Royal College of Veterinary Surgeons. Mr. Cameron, Principal Williams, Mr. Rutherford, Mr. Durkie, and others took part in the discussions, and it was agreed to forward the following resolution :—

"At a meeting of the Scottish Metropolitan Veterinary Medical Society, held in Edinburgh on the 29th November 1899, it was proposed by Mr. Henry Thompson (Aspatria), and seconded by Mr. Peter Moir (Edinburgh), that this Society communicates with the Royal College of Veterinary Surgeons, and every Veterinary Medical Society in the United Kingdom, to join with it in testifying to the Local Government Board, London, that the unanimous opinion of the veterinary profession is in accord with the following resolution, viz. :—'This Society is of opinion that meat inspection and the supervision of the lower animals destined for the food and milk supply of the nation should be placed in the hands of trained veterinary surgeons. It also is of opinion that, to secure the efficient conservation of the public health, the employment of inspectors selected from the veterinary profession is the safe and only means of attaining that object.'"

Consumption in Cattle and Human Beings identical.—At a meeting held at Westow, near York, on Thursday, 7th December, the Rev. F. Lawrence, Vicar, presiding, Colonel Steel, of the Yorkshire College, Leeds, delivered a lecture under the auspices of the County Council on Veterinary Hygiene, in the course of which he said that tuberculin had proved in 95 per cent. of cases to be a safe and trustworthy test. At the close a resolution was passed unanimously, on the motion of Mr. John G. Middleton, Assistant Secretary of the Church Sanitary Association, seconded by Mr. W. Ripley, to the effect that the Government be asked to give compensation for the carcases condemned by the authorities as affected with tuberculosis, and that only duly qualified meat inspectors be appointed.

THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY.

THE annual general meeting was held at the Grand Hotel, Aytown Street, Manchester, on Thursday, December 7th, 1899. Geo. Morgan, Esq., President, in the chair. Present: Messrs. E. Faulkner, T. Hopkin, W. A. Taylor, A. Lawson, J. E. Scriven, Wm. Woods, J. B. Wolstenholme, F. Armstrong, J. Abson, M. Robinson, J. Clarkson, A. Hodgkins, Professor Hobday, and the Secretary.

Minutes of the last general meeting were taken as read, passed, and confirmed.

Letters of apology for non-attendance were received from Messrs. J. F. Simpson, A. W. Mason, A. L. Butters, J. H. Carter, A. Dobbyn, and W. Carless.

The PRESIDENT, in making a few observations, said: It was humorously stated the other night by a chairman at a social dinner that as a rule people's perception of the superfluous was only in embryo, and failed to see that a chairman cannot make an interesting speech year after year about a particular object, because everything that could be said about the subject had already been said, and what he had to say would be superfluous. How little did he think when arraying the order of procedure at the annual meeting that I was preparing a rod to beat myself with. All has been said during the thirty odd years we have been in existence that can well be said in support of the Society, and whatever remarks are made by me are in a manner superfluous. I may, however, congratulate the members on the continued success of the Society, and also the fact that during the year a considerable sum has been distributed under the Benevolent branch.

The SECRETARY, in presenting his annual report, had much pleasure in recording the continued growth and success of the Society. During the past year 27 new members had been enrolled—one had resigned. At the present time we have 222 members. Your Council have met three times during the year, and had some four or five cases to decide upon. In two instances it was resolved that the cases ought to be defended. One came to a trial, with the result—"Verdict for the defendant, with costs." The second case was not proceeded with. One case could not be supported by the Society, inasmuch as the action arose before the applicant had become a member. In another instance it was decided that it was not one for defence, and advised the defendant to try and settle the matter amicably. This advice was taken with good results.

With regard to the Benevolent branch, your Council have had many applications, but I am pleased to report that only one of them was related to a member of the Society, all the others being relations of *non-members*—the several amounts being as follows:—

Grant to Mrs. K. C. £1 every lunar month until such time as the Council thought necessary.

Grant to Mrs. A. L. G. of £10 per quarter for four quarters, after which the case to be reconsidered.

Donation to Mrs. R. of £5.
" " Mrs. D. G. K. of £10.
" " Mrs. J. D. R. of £5.
" " Mrs. R. B. of £5.

The sum of £10 : 10s. was voted to the "Hewson Defence Fund" out of our defence fund.

I am sorry to say that several of the gentlemen, "members of the profession," who supported some of the applications, were non-members of our Society. May I once more appeal to all members of our profession who have not joined us to take the first opportunity of doing so. We have been doing a good work for a number of years, and the scope is now considerably extended since we altered our rules. We are all liable to litigation, and when trouble does come it is a great help to those concerned to be able to lay their case before a number of their confrères, who will give you the best of their advice and help to defend your case if needed, both in person and in kind; and if you do not require their help, you have the satisfaction at small cost of helping a brother practitioner when in trouble, and his widow and children when in need. The entrance fee is £1 : 1s., and annual subscription 10s. 6d., payable in advance, January 1st, in each year.

The Treasurer, in presenting his report and balance-sheet to date, said the accounts would as usual be audited at the end of the year, and a copy of the balance-sheet forwarded to each member.

The following officers were appointed for the year 1900 :—

President—Geo. Morgan, F.R.C.V.S., Liverpool; *Vice-President*—W. A. Taylor, F.R.C.V.S., Manchester; *Treasurer*—Ed. Faulkner, M.R.C.V.S., Manchester; *Secretary*—Sam. Locke, M.R.C.V.S., Manchester; *Council*—A. L. Butters, M.R.C.V.S., London; J. S. Carter, F.R.C.V.S., Bradford; T. Hopkin, F.R.C.V.S., Manchester; A. Lawson, M.R.C.V.S., Manchester; A. W. Mason, F.R.C.V.S., Leeds; R. S. Reynolds, M.R.C.V.S., Liverpool; J. E. Scriven, M.R.C.V.S., Tadcaster; R. C. Trigger, F.R.C.V.S., Newcastle-under-Lyme; W. Williams, F.R.C.V.S., Edinburgh; J. B. Wolstenholme, F.R.C.V.S., Manchester; W. Woods, F.R.C.V.S., Wigan; J. E. Kitchen, M.R.C.V.S., London; *Auditors*—Messrs. Butcher, Litton, Pownall, and J. B. Wolstenholme.

A vote of thanks to the officers of the past year and to the chairman closed the proceedings.

The Right Honourable Walter Long, M.P., President of the Board of Agriculture, at the Annual Meeting of the Scottish Chamber of Agriculture, held in Edinburgh on Wednesday, 13th December, said, in reference to meat inspection and tuberculosis :—"What we want to do is to spread more particularly accurate knowledge as to what the dangers of tuberculosis are. We want a more intelligent and a more uniform administration of the law in regard to inspection of meat generally, and then, I think, the number of cases of seizure and condemnation of these carcases would be very much less than it is at this time. At all events, it is not for me to say ay or no to their demand for compensation. That comes under the laws of Public Health; but I am inclined to think that the Local Government Board would give you an answer very similar to the one I have given, and I think the Public Health authorities, who are called upon to condemn carcases as unfit for food, would have some difficulty in drawing a distinction between one kind of disease and the other, and one kind of destruction and the other."

MEAT INSPECTION.

[Remarks which would have been made at the Agricultural Conference held in Edinburgh on 13th December, between the Right Honourable Walter Long, M.P., President of the Board of Agriculture, and the representatives of the various Scottish Agricultural Societies, by W. Owen Williams, speaking to the last two words of the Reverend Dr. Gillespie's motion in respect to meat, namely,—"rigid inspection." This statement would have been made at the time, had not the sad death of General Wauchope been announced during the proceedings, and a general feeling expressed that the Conference should terminate.]

SIR—At the International Veterinary Congress held in Baden-Baden last August, at which were present State veterinary surgeons from many countries, it was decided to suggest to the different countries represented, that "there should be introduced a universal and compulsory system of insurance for slaughter animals, in the interests of meat inspection and the stamping out of cattle diseases."

I would suggest that this matter be taken in hand by the Government of this country, as it is a matter of *national* importance, and that the expense of carrying it out should be paid out of the national exchequer. In St. Petersburg, compensation is paid for *every* animal seized, and they say there, that it is better to pay compensation and encourage people to send in their diseased animals, than not to pay compensation, and so promote the surreptitious buying and selling for human consumption of meat which is diseased. They also argue that no one would trouble to cultivate disease among animals, and that their method encourages men to bring forward diseased animals, and so rid the country of them.

The last Tuberculosis Commission suggested that in future meat inspection should be carried on only by men with a special training. It was not for that Commission to say the exact requirements of meat inspectors, but I feel certain that the members of the Commission, if asked the question, would answer that such men should be competent to judge between health and disease in life and after death in the lower animals, and I contend that the *only* men who can judge in such matters are duly qualified veterinary men. At the present time in this country a Local Authority may appoint whom it pleases to inspect meat—ex-policeman (all honour to them), retired butchers (because they know all about it?), and such-like farcical persons. Even more, a body known as the Sanitary Institute is now giving a two *months'* course in meat inspection to none but sanitary inspectors, who, if they pass an examination (which, if given properly, would take a final year's veterinary student to grapple with), will be duly recognised meat inspectors, and competent to accept appointments throughout the country.

I wish to expose the sham of this examination. The subjects mentioned can *not* be properly learned by any man in two months; the men who pass will only have undergone a cursory and superficial examination. It will be like saying that a man has passed in mathematics when he has shown proficiency in simple addition; or that he knows Latin because he calls his father Pater. Out upon such shams!

Now if an examination properly carried out were set for young veterinary surgeons, it would be to them a review of their four years' work; perhaps

even some of them would be unable to pass it. But look! who are the men who alone are eligible for the examination—sanitary inspectors—men whose business in life is to seek out smells and nuisances, to see that drains are flushed, that dung-heaps are cleared away, that houses are fumigated, and such-like matters. Their special qualifications are strong stomachs and keen senses of smell, neither of which necessarily indicate a knowledge of diseased meat.

Surely the British public will listen to the recommendations of the International Veterinary Congress. The Congress makes the following suggestions :—

1. The Congress desires to draw the attention of the Governments of the States officially represented to the necessity of the general introduction of compulsory inspection of meat.
2. None other than certificated veterinary surgeons should be summoned as professional men to inspect meat. In places where it is still impossible to establish a regular veterinary service, lay inspectors with limited powers may be provisionally appointed. These must be trained for their profession as much as possible by veterinary surgeons in the larger slaughter-houses, be examined by the State, and constantly be controlled in the exercise of their function by veterinary surgeons. Only veterinary surgeons should be appointed as professional inspectors of meat, and as the directors of slaughter-houses and cattle-sheds.
3. Instruction in meat inspection at the veterinary colleges must be improved and extended. Meat inspection should be made as far as possible the object of practical examination for a veterinary diploma, and should be made necessary for the obtaining of the diploma as a veterinary surgeon. Moreover, it is required in this case, that the candidate shall have worked at least eight weeks in the meat inspection of a large public slaughter-house, standing under regular veterinary supervision."

Doubtless when the war is over, those who return will have something to say about the bad meat in the "Arawa," the "Nubia" and other transport ships, and ask who is to blame.

I am thankful to say that no blame can be attached to our profession, but I have no doubt that those in authority will also wash their hands of any responsibility, and none will ever here the names of those really responsible and guilty.

In conclusion, I would beg, Sir, to ask you to carefully consider the facts I have laid before you, and draw your own conclusions as to which body of men the agriculturists of this country would care to entrust the examination of dead meat, and from which body they would be likely to obtain an unbiassed and reasonable opinion.

"SPRATT'S," as in previous years, has issued their Calendar, which is beautifully got up, and a most instructive one, as on each page it gives a good portrait of different typical dogs of various breeds, and we need not remind our readers how very useful it is to be able to say to a client whether or not his dog is a good one.

Send a penny to "Spratt's Patent," Bermondsey, and they will send a copy post free.

INSPECTION OF MEAT AND DAIRIES.

In regard to the inspection of dairies, I may first mention that in the burgh of Hawick we have a periodical examination of dairy cows by a veterinary inspector. In my opinion, no matter how qualified a sanitary inspector may be, he is not at all qualified to examine and report upon cows suffering either in the udder or from tuberculosis; in fact, I consider it highly dangerous in the public interest that any unskilled person should be appointed to such an important post. If, then, there is to be inspection at all, it should be a proper one. In Hawick inspection is thoroughly carried out, and regular reports submitted to the local authority. In the county, however, where better things might have been expected, since the 1892 Act came into force there is no veterinary dairy inspection. The local authority of Hawick have several times pointed out this—because a lot of milk is brought into the town—but still such inspection is set aside, probably on the ground that there is no milk sold or consumed in the county. It is important here to note that when any epidemic has broken out through milk, the source has always been traced to a county byre. With regard to the tuberculin test, there is, as you are aware, a difference of opinion. In Hawick we have had a medical gentleman going the length of calling it a fad and a humbug. Whether or not he was speaking from personal knowledge I do not know, but I am certain that tuberculin will not be exploded as soon as he prophesies. I have had letters from some of the most experienced experts of the day, asserting that it is a sure test if properly regulated. You all know what the accomplished horse-couper can do to the animals he deals in; and I am informed that experienced dairymen can apply the tuberculin test in such a way as to make the cows impervious to it. What I should like to see would be the tuberculin under Government control, so as to prevent any one who is not a qualified veterinary surgeon getting it.

(*Paper read by Mr. John Macdonald, Sanitary Inspector, Hawick, at Sanitary Congress, Hawick, September* 8, 1899.)

ARMY VETERINARY DEPARTMENT.

The following gentlemen have been engaged by the War Office for temporary duty in South Africa:—Messrs. A. J. Dalgleish, A. L. Farrant, J. H. Hulsebery, H. B. Kenney, J. E. Fowler, M'G. Glane, D. J. Quinlan, H. T. Ryan, H. O. Oliver, H. M. Webb, A. F. Deacon, W. C. Lowe, J. J. Aitken, C. H. Hylton Yaliffe, C. M. Sharpe, G. P. Knott, F. W. Trydall, F. M. Jarvis, A. N. M. Hamilton.

Mr. A. F. Deacon sailed from Liverpool on 21st November in SS. "Hermes" for New Orleans, from where he proceeds in charge of 700 mules to Cape Town.

Mr. J. E. Fowler left London on 22d November for Naples, from where he proceeds in charge of SS. "Fremona" with 1200 mules for Cape Town.

Mr. A. L. Farrant leaves Southampton on 4th December in SS. "Pinemare" in charge of half the Composite Regiment of Household Cavalry.

Mr. C. H. Hylton Yaliffe leaves Southampton on 2d December in SS. "Denton Grange" in charge of 152 remounts.

Mr. A. J. Dalgleish leaves Queenstown on 5th December in SS. "Atlanian" in charge of 388 horses of Brigade Division of Field Artillery.

Messrs. Hulsebery, Glane, Lowe, Webb, Quinlan, Aitken, Knott, Oliver, Kenney, and Sharpe, leave Liverpool in SS. "Canada" on 30th November for duty in South Africa.

The following are the names of the Army Veterinary Department in South Africa:—Vet.-Lieut.-Colonel J. Matthews, P.V.O., Vet.-Lieut.-Colonel G. J. R. Rayment; Vet.-Majors F. F. Crawford, W. Gladstone, W. A. Crowe, F. Smith, D. C. Pallin, G. H. Fenton, E. Day, F. W. Faridyke; Vet.-Captains J. Couper, L. J. Blenkinsop, R .W. Raymond, F. W. Sharp, J. G. O'Donnel, A. F. Richardson, F. B. Drage, E. W. Larnder, A. C. Newsom, F. Eanie; Vet.-Lieutenants J. Moore, J. Loughlin, C. B. M. Harris. W. J. Patam, C. Rose, H. A. Sullivan, W. D. Smith, A. England, H. T. Sawyer, G. M. Williams, A. H. Lane, F. W. Wilson, F. U. Carr, J. F. Coley, F. H. Share, E. B. Bartlett, R. C. Cochrane, J. B. Southey, A. G. Todd, H. M. Durrant, G. Conder, A. J. Williams, J. J. Griffith, E. Brown, R. F. Houston.

The following officers are engaged on remount duty:—Vet.-Major R. Rowe, J. J. Phillips, Italy; S. Duff Gillespie, South America; T. Flintoff, South America; Vet.-Captain M. Smith, New Orleans; C. E. Nuttall, Australia; E. J. Lowson, Australia.

BRITISH CONGRESS ON TUBERCULOSIS.

A PRELIMINARY meeting in connection with the British Congress on Tuberculosis, to be held in the spring of 1901, was held yesterday afternoon in Gray's Inn-hall, under the presidency of the Earl of Derby. Among those present were the Duke of Northumberland, Earl Spencer, Lord Strathcona, Lord Russell of Killowen, Viscount Templetown, Lord Loch, Sir Samuel Wilks, Sir James Blyth, Sir J. Brunner, M.P., Sir J. Crichton-Browne, Sir William Broadbent, Professor Corfield, Professor M'Fadyean, Dr. Heron, Dr. Hillier, Dr. Constantine Holman, Dr. Moore (Dublin), Mr. Shirley Murphy, Dr. St. Clair Thomson, Dr. Theodore Williams, Mr. James Pollard, Mr. Swithinbank, and Mr. H. C. Richards, Q.C., M.P.

The Chairman, in opening the proceedings, said that the present was the time when the arrangements for the Congress must be made, and he much regretted to state that the Prince of Wales would not be able to take part in the earlier stages of the arrangements. They were aware that recently an International Congress was held in Berlin under high auspices upon the subject which interested them and which had brought them together. It was proposed that a similar Congress should be held in England in 1901, and it was desirable that the arrangements should be put in hand at once, so as to enable the proper committees to be formed, so that when the Congress took place it should be from the first a thorough success. (Hear, hear.) They were glad to think that the Prince of Wales had graciously consented to preside over the members of the Congress and to open it in person. (Cheers.) They were met that day to discuss the question of organisation. The enemy which they had to combat was

ignorance, and that enemy must be combated by the same remedies as the disease which so frequently sprang from it. Those remedies were light and air—the light of science, the fresh air of public opinion. (Cheers.) Since he entered that building he had heard with very great regret of the death of one who took a most earnest interest in those proceedings, and who within the last few days wrote a letter on that subject—Sir Richard Thorne. He regretted to hear that he had passed away, and, although they could pass no formal vote of thanks, all there present would sympathise with the loss of one who had done great and very important work. (Hear, hear.)

The Duke of Northumberland moved the first resolution, which was as follows:—"In view of the fact that tuberculosis, although a preventible disease, still devastates health and destroys lives in all parts of the world, this meeting, consisting of representatives of medical, veterinary, and sanitary science, and also principal officials of municipal and county authorities, is unanimously of opinion that it is desirable to hold a national Congress on tuberculosis in the spring of 1901, to which representatives from India and all dependencies of the Empire should be invited, and in addition honoured guests from other countries." There be could no doubt that the subject was one of the most vital interest to the well-being of this country, and indeed to all mankind, and it was of the utmost importance that the question should be thoroughly threshed out, and that we should acquire all the knowledge in regard to it that it was possible to acquire, in order to make that knowledge the basis of our operations.

Lord Templetown, President of the National Agricultural Union, moved:—"That those present at this meeting be *ipso facto* members of the general committee. That the names mentioned in the attached list form the organising council, with power to add to their number. That the Earl of Derby be President of the said council, that Sir William Broadbent be chairman, and Mr. Malcolm Morris be appointed secretary-general." The following is the list of names referred to in the resolution:—Lord Strathcona, Sir James Blyth, Sir William Broadbent, Sir George Brown, Sir John Brunner, M.P., Sir Ernest Clarke, Sir J. Crichton-Browne, Sir Edward Hulse, Sir Henry Littlejohn (Edinburgh), Sir Herbert Maxwell, Professor Clifford Allbutt (Cambridge), Professor Corfield, Professor Delépine, Professor M'Fadyean, Professor Sims Woodhead (Cambridge), Colonel Macleod (Netley), Colonel Montefiore, Dr. Burton Fanning, Dr. Henry Green, Dr. Grimshaw (Registrar-General of Ireland), Dr. Heron, Dr. Hillier, Dr. Constantine Holman, Mr. A. Macfadyean (Jenner Institute), Dr. Hector Mackenzie, Dr. Moore (Dublin), Mr. Shirley Murphy, Dr. Niven (Manchester), Dr. Isambard Owen, Dr. R. W. Philip, Dr. Sedgwick Saunders, Dr. St. Clair Thomson, Dr. Thomson (Bournemouth), Dr. Dawson Williams, Dr. Theodore Williams, Mr. Newsholme (Brighton), Mr. James Pollard, Mr. Rube, and Mr. Swithinbank.

Mr. Leon, chairman of the Public Health Committee of the London County Council seconded the resolution.

Mr. Huish recently sent us a pair of parturition forceps for the smaller animals. These forceps are patented by Mr. M'Kenna of Dublin, and are undoubtedly the very best we have ever used. They are so constructed that they can be used for any size of fœtus without any trouble in adjustment.

THE INFLUENCE ON HEALTH OF CHEMICAL PRESERVATIVES IN FOOD.

EXTRACTS FROM A PAPER BY ALEXANDER G. R. FOULERTON, F.R.C.S. ENG., D.P.H. CAMB., F.C.S.

THE conclusions which I have come to with regard to the use of boric acid and formic aldehyde as food preservatives are as follows. Taking the case of milk first, it is extremely improbable that either preservative, if used in the proportions mentioned at the beginning of this paper, would cause any injurious effect whatever to the average adult taking the ordinary amount of milk with his daily food. But because of certain possible injurious effects which might be produced, the use of such preserved milk for invalids and young children taking large quantities is to be condemned. And, so far as these injurious effects are concerned, it appears unlikely that the digestive processes would be materially affected—or, indeed, affected at all—by the boric acid, but that toxic effects in a more general way might be produced by this preservative. Formic aldehyde, on the other hand, would probably have absolutely no injurious general effect in the proportions used, but would tend to lessen somewhat the digestibility of the milk. The necessity for legislation on this question lies in the fact that these preservatives are, in the quantities used, tasteless, and so cannot be detected by the consumer. If, for instance, preserved milk could be distinguished from fresh milk as readily as salted beef can be distinguished from fresh beef, no necessity for legislation would arise. The consumer would know exactly the kind of article that he was buying, and there the matter would end. There would then be no more reason for prohibiting the sale of preserved milk than there would be for prohibiting the sale of salted beef on the ground that the latter was not suitable for making beef-tea for invalid diet. But since the public have no means of distinguishing between a fresh and a preserved milk, special legislation does seem absolutely necessary. And such legislation to satisfy the requirements of the public health should provide that no preservative whatever, the use of which is not sanctioned by the Local Government Board or the Board of Agriculture, should be used for milk; that the proportion of such preservative should not exceed a certain maximum amount to be fixed officially; that the nature of the milk should be declared by the vendor, and that it should be sold only as "preserved milk." And, finally, the penalties for infringement of the law should be sufficiently heavy to render the sale of "preserved milk" as fresh milk unprofitable.

With regard to other articles of food special cases must be dealt with on their own merits, but I do not think that there is any other article of food in which the use of a preservative is so important as it is in the case of milk. It is, for instance, difficult to find any good reason for the presence of salicylic acid or other special preservative in such articles of food as jam, cheese, and pickles, whilst the use of certain preservatives as substitutes for alcohol is a matter of fraud pure and simple. So also the use of a tasteless preservative in butter cannot be regarded as other than fraudulent unless the fact is declared; by using such a preservative the vendor is enabled to sell as fresh butter what under the former conditions would have been sold at a lower price as salt butter. The use of boric acid, again, for salting bacon and ham may or may not cause injury to the consumer, but in any case the latter should have the opportunity of exercis-

ing his own judgment on the matter as to whether he will eat that class of preserved food. And, in short, it appears to me that if the regulations suggested for milk were applied to all other articles of food of a perishable nature, the requirements of the public health would be as safe-guarded as far as possible, and at the same time the legitimate use of preservatives would not be interfered with.

PRESIDENTIAL ADDRESS.

BY W. PENHALE, M.R.C.V.S., BARNSTAPLE.

At a Meeting held in Exeter on 23d November, to the Members of the Western Counties Veterinary Medical Association.

GENTLEMEN—A short time since I received a communication from our worthy Secretary saying that, although late in the day, he thought I should give you a short address, and I notice on the agenda paper an intimation to that effect. I will not detain you long, but there are a few points upon which I should like to touch.

First of all I desire to thank you for the honour you conferred on me in electing me your President during the most important year of this Association's existence, and before I go further I wish to congratulate the members of the Association on the very handsome and brilliant reception you gave to the National Veterinary Association at its Plymouth meeting. Much of that success was due to the two Presidents and their two untiring and energetic secretaries elected for the occasion,—Messrs. Bloye, Elder, Bond, and Dunstan. Nothing can exceed the splendid manner in which these gentlemen carried out their duties, or the foresight they displayed in making the ample and numerous arrangements which were necessary for such a large undertaking, and which passed off so smoothly, without a hitch of any kind. You have had the balance-sheet presented to you, and it is satisfactory to find there is a sum still remaining in hand. I hope it will be placed on the minutes of this Association the valuable services these gentlemen have rendered.

It is a custom with presidents of our various Associations to allude to important topics which may be under discussion affecting the profession as a whole.

The Royal College of Veterinary Surgeons, after a period of great activity, which had for its object a prolonged course of study, a higher education, and the consequent elevation and improved status of the profession, has relapsed into a state of quiescence; but showing some vitality now and again, endeavouring, as it has done, to influence the War Office in improving the position of veterinary officers in the Army, both as regards rank and pay. The only point to interest us here as general practitioners is that of veterinary surgeons serving with yeomanry regiments. It does seem strange that, however willing the commandant of a yeomanry regiment may be to promote a veterinary-lieutenant to higher rank, he can only do so after fifteen years' service; and yet the medical officer may be raised after seven,—this is an inequality which should have no existence.

The veterinary surgeon has never stood out with such prominence and importance as he does to-day in matters relating to public health; he is now rightly regarded as the one man who by his teaching and training is the

best fitted to judge whether that portion of our food supply derived from the animal world is wholesome or detrimental, and we find one local authority after another appointing veterinary surgeons as meat inspectors. The day cannot be far distant when our advice will also be sought in a wider sense in sanitary matters, such as the construction of buildings. How often do we find a cowshed or stable, on which hundreds and sometimes thousands of pounds have been spent, affording a minimum of convenience and accommodation, and with scarcely any regard to sanitation or hygiene. One of the efforts for combatting tuberculosis will undoubtedly be in the direction of erecting better drained and better ventilated cowsheds. I should like to say here that I regard it as an insult to our examiners, and offering a disgrace to our diploma, for a veterinary surgeon to sit for the certificate of the Sanitary Institute. These certificates are held in my neighbourhood only by bricklayers and carpenters and the like, and for a veterinary surgeon, after four years of the most careful teaching and training, reducing himself to the level of this class is nothing less than cringing for the sake of an appointment which no man with a proper respect for his profession should think of. The remedy is to stand aloof for a short time, and as we alone possess the necessary scientific training and knowledge for adequate meat inspection, the Local Government Board is bound to come to terms with us sooner or later.

The old Veterinary Department at Whitehall, and the Board of Agriculture in later times, with the assistance of our profession, have rendered valuable services to the State and to the agricultural community; many animal scourges have been stamped out altogether, and others more or less held in abeyance. Cattle plague, foot-and-mouth disease, and pleuropneumonia have disappeared from the land, and that fearful disease rabies will be very shortly placed in the same category. But much more remains to be done and can be done with the greatest advantage to stock-owners and the consuming public.

Swine fever should be gripped with a much firmer hand. The partial method of inspection now taking place in this country is liable to lead to centres of infection remaining untouched, and void of any precaution or disinfection, so that the money which is actually spent in endeavouring to suppress the disease is only uselessly wasted, besides causing a good deal of ridicule and irritation among pig-owners.

With a little vigour glanders might be stamped out, with great gain to the horse-owners of the metropolis.

Black-quarter should be registered as a contagious disease. The annual loss this scourge inflicts on our suffering farmers is enormous, annual loss at a rough computation of from 6 to 10 per cent. of our young rearing stock, representing a vast sum of money, and yet the deadly germs of this disease are daily scattered over the country without a word of warning or control of any kind. If black-quarter were included in the list of contagious diseases each carcase could be disinfected and securely buried.

We are all agreed that there is urgent need for State interference in the matter of tuberculosis; the disease is spread by contagion, and is dangerous both to man and animals, the bovine tribe being especially susceptible. That a man may, without interference, test his animals with tuberculin and dispossess himself of those reacting in a public market, and distribute them to unsuspecting buyers into healthy herds, is a crying shame, and is certainly spreading a disease which is already by far too prevalent.

The Milkshops, Dairies, and Cowsheds Order of 1885 and 1899 is treated as a dead letter by the majority of local authorities, and whereas we are remarkably scrupulous and particular over a little harmless adulteration of our sugar or coffee, yet, as Dr. Slade King put it, "there is the daily scandal going on of mixing with our children's food milk swarming with disease germs." There are few local authorities who have very rightly appointed a veterinary surgeon to inspect the dairy cows of their district periodically, but power under this Order is required for the compulsory use of tuberculin in suspected cases of tuberculosis. There can be no doubt that the prevalent idea that tabes mesenterica is in the majority of cases caused by milk containing the bacilli of tubercle is in error, for, quoting from Dr. Slade King's figures, which relate to my neighbourhood: "In North Devon the infant mortality per 1000 births is 112·5; it is certainly below the national rate of 161, but it shows a continual upward movement. "In 1897 it was 106·5; in 1896 it was 102. This excess in 1898 is both marked and unsatisfactory within the Urban Districts of Ilfracombe and Barum, where it exceeds the National rate, also in Bideford, 155·1, in Northam, 145·9. The milk supply of Ilfracombe, Barum, and of Bideford is to a very large extent imported into these towns from the rural districts which surround them, so that the effect of its use on the infant population, be they rural or urban, must be fairly identical, yet the infantile death rate within Infracombe Urban is only 0·1 below 165, but within the surrounding rural district it is 75·5; within Bideford Borough 155·1, but in the rural district 62·8; within Barum Borough 163·8, but in the milk-producing rural district outside 75·5. Tubercular diseases must be considered in the light afforded by the returns of the Registrar-General, who points out that the death rates of children under five years of age from tubercular diseases, during the ten years 1881-90, in Devonshire were 3947 per million living, while in Wiltshire, Dorsetshire, and Somerset they were considerably lower, viz., 2924, 2401, 2633 per million living."

I think most of you will agree that this high infant death rate from tubercular disease cannot be all traced to the cow, for we know that our herds, when compared with other parts of the country, are moderately free from tuberculosis, and a tuberculous udder is rare. But this is no reason why a preventible disease, dangerous alike to man and animals, should be allowed to go unchecked in our midst.

In conclusion, I will add that now both local authorities and the public generally seek and value our opinion and advice, and it is to be devoutly hoped they will remunerate our services at something like their proper estimate and value, for in our work we have to bring to bear great skill, and scientific knowledge of the highest quality.

As regards the fees of the Board of Agriculture there is nothing to complain of, but many of the County Councils of this country pay their veterinary inspectors in the scantiest manner. It is possible in this county to be called upon to inspect a flock of 200 sheep or more for 5s., and to travel a distance of four miles to undertake a dangerous and important investigation as to whether a dog is rabid or not for a like sum. Seeing that to gain our special knowledge we are compelled to go in for a costly and lengthened course of study, this can scarcely be regarded as fair recompense.

CUTANEOUS LESIONS IN STRANGLES.

BY W. R. DAVIS, M.R.C.V.S.

STRANGLES has been classed by some writers as an exanthematous disease, and one must therefore suppose that skin troubles are not infrequent accompaniments of the malady. I cannot, however, remember to have met with such until recently, and I was rather puzzled with the appearances when I did see them. A bay harness horse, six years old, doing easy work, was found to be off his feed, and to be coughing a little. He was, however, kept at work, and in a few days showed more alarming symptoms, and I was asked to attend him. I found the animal extremely dull, respirations and pulse accelerated, and temperature 103°.

The throat was sensitive to pressure, there was a slight cough, and some difficulty in swallowing.

I stimulated the throat and prescribed febrifuges, and for food scalded linseed and carrots. I considered the case to be one of ordinary angina, though the great prostration and the rather high temperature suggested strangles, which I ought to say was affecting a good many horses in the neighbourhood. However, there was no discharge from the nostrils, nor were the intermaxillary lymphatic glands swollen.

On visiting the patient two days afterwards, I was astonished to find the skin of the flanks, shoulders, and extremities covered by a diffuse eruption. The hair looked rough and bristly, and on rubbing the hand over the affected parts one got the sensation of going over little elevations of the integument, which, though rounded, were not well defined, and were about the size of a large pea. They were present in enormous numbers in the areas of skin involved; in fact these areas were completely covered by them. They were soft and quite painless, and appeared to me to be due to little serous effusions into the papillary layer.

There was still no nasal discharge, nor were the lymphatic glands swollen. On palpating the parotid, however, I found a very tender place, and on comparing the two sides found that there was slight swelling. I now made up my mind that I was dealing with a case of strangles, that an abscess was forming in the bunch of lymphatic glands below the parotid, and that the eruption was the cutaneous lesion of the case. Two days afterwards the eruption had entirely disappeared, and left no trace. The parotid abscess was opened two days later, and exit given to a large quantity of pus, and a rapid recovery resulted.

The second case was that of a nag which after recovery from a typical attack of strangles was brought to me by its owner, who had worked the horse for a few days. On each side of the spinal column and on the quarters were plaques of infiltrated skin, and on the surface of these well-defined vesicles. Where the pad and crupper had pressed on them they had broken, discharged, and formed crusts.

I ordered the horse to be thrown out of work for a week, and applied zinc ointment to the parts with the best results. It is possible that these eruptions in the course of strangles occur not uncommonly, but being evanescent, and no doubt sometimes very limited in extent, may be often overlooked.

Nocard says that they may be the only lesion present in an attack of strangles. It would be awkward if one met with one of these cases, mistook it for "surfeit," and gave a dose of physic.

INSTRUCTIONS FOR THE USE OF ANTI-VENOMOUS SERUM.

ANTI-VENOMOUS serum comes from the serum of a horse immunised against the bite of serpents. It preserves its properties for an indefinite time, provided that the bottle which holds it is kept carefully corked, and away from the light. It is not affected by heat up to 60° Centigrade (104° Fahr.). It is used by means of hypodermic injections in all cases of bites from poisonous serpents or scorpions. The serum neutralises the effects of the poison proceeding from every known serpent in Europe, Asia, Africn, Oceania, and America.

The proper dose is about 10 cubic centimetres, say a whole bottle, for children and adults in the case of European vipers or the smaller serpents in tropical countries. In the case of bites from large serpents such as the cobra di capello of India, the naja-haje of Egypt, hoshrops of Martinique and South America, the rattle-snake of Central and North America, it is better to inject two doses together, about 20 cubic centimetres, on one injection.

Aid should be given as soon as possible after the bite, for in tropical lands the bites of certain reptiles prove fatal in a few hours. Even in the gravest cases one can prevent death and stop the poison spreading if one injects the serum at a period of not longer than four hours after the bite. There is no danger in injecting large quantities: the serum contains no poisonous substance, and never causes accidents.

The sub-cutaneous injections should preferably be made in the cellular tissue of the right or left flank, since no pain is caused by them at these parts. A sterilisable syringe should be used with an india-rubber or amianth piston, having a capacity of from 4 to 8 cubic inches. Before the injection the syringe should be boiled for five minutes in water with a little borax added, the latter preventing the needle turning rusty. Carefully wash the skin of the patient with soap and water, and then with an antiseptic solution. The needle is then pushed deep into the cellular tissue; the injection is made in a couple of minutes, and the needle quickly withdrawn. The serum is absorbed in a few moments. These precautions in the matter of cleanliness are useful for preventing abscesses. They may be dispensed with if time is pressing and the life of the patient in immediate danger.

The anti-venomous serum prepared by the Pasteur Institute of Lille contains no carbolic acid. Its power as an anti-toxin may always be verified thus:—Inject 2 cubic centimetres into the veins of a rabbit weighing about 4 lbs. Five minutes after it will be able to withstand a dose of any poison calculated to kill in twenty minutes any ordinary rabbit of about its own size.

A slight albuminous precipitate in the bottle need not indicate a defect in the serum. But if the serum is quite dull, with a milky appearance, it should not be used, as then the air has got into it, and it might cause abscesses.

The first precaution to be taken when bitten by a reptile is to compress the wounded limb by means of string or a pocket handkerchief as close to the wound as possible, and between it and the "root" of the limb. Wash the wound caused by the serpent's teeth thoroughly, and make it bleed. Then wash it with a fresh solution of chloride of lime, consisting of 15½

grains in sixty times that amount of distilled water, or with a solution of chloride of pure gold of 15½ grains to 100 times that amount of distilled water. These two substances quite destroy the venom in the wound. After that an ordinary antiseptic dressing may be applied. It is useless to cauterise the wound with a hot iron or any chemicals; avoid giving ammonia or alcohol, which might be harmful to the patient and to the action of the serum.

Treatment of Poisonous Wounds in Domestic Animals.—In certain countries many domestic animals (such as cows, sheep, horses, dogs) are killed every year by poisonous serpents, thus causing considerable loss to agriculturalists. The use of anti-venomous serum would enable these losses to be avoided. The treatment is the same as in man, and the same doses are given. When injecting into an animal it is best to do it under the skin of the back, between the shoulders.

Finally, when animals are in a very alarming condition, it is better to inject by means of the veins, using the jugular vein in the case of horses, cows, and sheep, and the saphena in dogs, just at the back of the knee.

1 cubic inch = 16·38 cubic centimetres.—(*Recueil de Médecine Vétérinaire.*)

ROUGH WEIGHTS AND MEASURES.

BY HAROLD LEENEY, ESQ., M.R.C.V.S.

READERS of the *Field* will have observed an article based on a pamphlet issued to the troops in South Africa, and forwarded to that journal on the responsibility of Major J. A. Munn, F.R.C.V.S.

After giving the relative weights of florins, half-crowns, sovereigns, &c., an attempt is made to provide for measures of fluid drugs. It is stated that "an ounce is equal to a table spoonful," and so on down the scale, each spoon being said to hold just twice the quantity intended in physicians' prescriptions. The teaspoon might be considered an exception, as it is made in various capacities, but the dessert and table spoon, I believe, have retained their original shape as well as capacity.

Major Nunn has been good enough to explain to me in a letter that the spoons in use up country and on the veldt generally are of tin and iron, and do contain variable quantities, but something like an ounce usually, and there was no error in printing the pamphlet.

The editor of the *Field*, whose attention has been called to the subject, says—"On testing an ordinary modern table spoon and a dessert spoon, it was found that the first when quite full held exactly one fluid ounce of water, and the latter half that quantity."

I have measured mine, and find that, unless "heaped up" by capillary attraction of greasy edges, that the table and dessert spoon hold *half* the quantity stated in the pamphlet and by the editor of the *Field*.

Major Nunn assumes that soldiers are prone to increase the doses, and implies in his letter that the exaggeration is meant to counteract this propensity, but how this is likely to come about if the table spoon capacity is not exaggerated it is difficult to see.

Regarded from any point of view, it would seem extremely unsatisfac tory that the physician and the dispensing chemist should mean half an ounce and the military authorities and readers of the *Field*, whether in the house or the stable, mean a whole one.

If the modern table spoon has doubled in size, as the teaspoon is often found, it should no longer be a popular measure for medicines either for man or beast. The more careful dispensers have discontinued sending out medicine in plain bottles with labels directing so many spoonfuls, and employing graduated bottles, but if your chemist were asked to dispense so many table spoonfuls of a drug, he would supply half-ounces, while you might imagine he was dispensing ounces.

Perhaps the editor will kindly tell us what is meant in the college pharmacy when a table spoonful is prescribed.

[As a matter of fact, we seldom prescribe "table spoons full," but when we do, we expect that a four-ounce bottle will contain a "table spoon full" eight times. We also reckon that a teaspoon contains one fluid dram.—*Ed. V. J.*]

NOTES ON VETERINARY SANITARY SCIENCE.

BY A. L. BUTTERS, M.R.C.V.S.

In dealing with the contagious diseases of animals, great prominence is given to sanitary measures. The object of this paper is to ascertain your views on the part played by bad and good sanitation in the origin and eradication of these diseases. To limit the discussion four only will be referred to, viz., pleuro-pneumonia and tuberculosis in cattle, glanders and influenza in horses. My attention was particularly drawn to this subject at the recent Congress of the Sanitary Institute at Southampton. A resolution "recommending the Council of the Sanitary Institute to urge the Government to undertake a scheme for the reduction of the prevalence of bovine tuberculosis was put to the meeting, and ultimately carried unanimously. During its discussion one of the speakers—a medical officer of health I believe—in the course of his remarks, said: "If you put your byres and cowsheds into a proper sanitary condition you will soon get rid of bovine tuberculosis." Had opportunity offered I would have expressed my dissent from this view of the subject. I should say that I may not have given you the exact words used, but, at all events, I have given you the correct meaning of his statement. When your President a week or two ago pressed me to bring forward a topic for discussion, I thought this meeting would be a very good place for me to state my views and submit them to your criticism, favourable or otherwise.

This subject is of greater importance to the veterinarian than perhaps appears at first sight. If the public believe that the contagious diseases of animals can be stamped out by sanitary measures alone, then the veterinary surgeon will never be employed. But if, on the contrary, they are educated to look upon sanitary measures in their right light, viz., that at the most they are only an unimportant auxiliary, compared with the work of the veterinarian, then the profession will be asked and allowed to occupy their right position in regard to these diseases.

Pleuro-pneumonia.—I cannot give you a better illustration of the blunders caused by erroneous ideas as to the part played by sanitation in the origin of contagious disease than by reminding you of an incident which occurred a good many years ago; I daresay most of you will recollect it. Pleuro-pneumonia was then rife in Norfolk, and a great many outbreaks were traced to store stock imported from Ireland. Complaints being made that the animals were infected before they left the sister isle, a veterinary inspector was sent over to investigate and report. In this

report the inspector attributed the outbreaks, not to previous infection, but to the insanitary system, common in Norfolk, of keeping their cattle, viz., in frame boxes in yards, never removing the manure, only putting in clean straw daily. When the animal had been there a few months he was then standing on a floor composed of four or five feet thick of good solid manure. The late Mr. C. S. Read, M.P., gave this report a severe criticism. His practical experience as a farmer and his common sense prevented his being misled by scientific twaddle. I need not remind you of the sequel. Pleuro-pneumonia has been stamped out, but not by sanitary measures, and the Norfolk farmers have no outbreaks now, although they have not yet altered their system of keeping their cattle.

Now, exactly the same erroneous reasoning was followed by the speaker at Southampton with regard to bovine tuberculosis as the inspector used as to contagious pleuro-pneumonia. I think, however, you will agree with me that without the adoption of measures other than sanitary we shall have tuberculosis in our herds for ever. Of course, before the true contagious nature of the disease was proved by the discovery of the bacillus by Koch, bad sanitary conditions and heredity were the generally admitted causes of its origin, and these ideas were slow to die. But with all our recently acquired and accurate knowledge of tuberculosis in cattle, it displays, I think, great ignorance to talk of sanitation even as a comparatively important measure for its eradication.

Glanders.—In connection with this disease, and bearing very strongly upon the subject under discussion, I will notice two remarks in the report recently issued by the Department Committee which was appointed to inquire into the working of the Act relating to glanders. Some witnesses. they said, suggested that "Local authorities should have powers to insist upon improved sanitary conditions even to the extent of structural alterations." Now this shows clearly the estimation in which sanitation, and its value in preventing disease, is held by some. Fortunately there were other witnesses who had come to a very different conclusion. We find immediately following that "other witnesses prove that the construction and general sanitary conditions of a stable have no connection with the introduction of glanders into that stable." With this I quite agree, and have nothing to add.

Influenza.—My remarks refer exclusively to that form known as "pink-eye" or "epizootic cellulitis" (Williams). From my own observation of outbreaks which have occurred in stables with very different sanitary conditions, I have found that animals living in stables with perfect sanitary conditions suffer more acutely and severely than animals in stables where there are practically no sanitary arrangements at all. The conclusion I have arrived at is that bad sanitary conditions have no part in the origin of contagious diseases, and that good sanitation plays a very unimportant part—if any—in their eradication. Your buildings—stable or byre—may be of such a size as to allow an air space of 1200 or 1400 cubit feet per head, have ventilating appliances that will change the air every twenty or thirty minutes, windows equal to one-tenth the floor space, the flooring impervious, and of material easily cleaned, drained outside, and properly trapped, the water supply pure, and the food wholesome. You may have all this, and yet the animals living in such a building are in no way protected against the introduction of contagious or infectious disease. And such a building is of no use by itself to enable you to stamp out these

diseases. To accomplish the stamping out of these requires the services of a skilled veterinarian to detect the visibly diseased, and in the case of tuberculosis and glanders to discover the animals with the disease in the latent form. When these are removed and disposed of, a little ordinary cleanliness at once puts the building right. It is the detection and removal of all the diseased animals which makes the stable or byre healthy for the remaining animals.

(*Read at a Meeting of the Royal Counties Veterinary Medical Association, on Friday, November 24th, the President, Mr. S. H. Slocock (Hounslow), in the chair.*)

TETANUS TOXIN AND ANTITOXIN.

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(Extracts from a Paper read at the Thirty-sixth Annual Meeting of the American Veterinary Medical Association, September 1899.)

The Isolation of the Specific Bacillus of Tetanus by Kitasato.—In April 1889 Kitasato[1] announced to the Eighteenth Congress of the German Surgical Society that he had successfully isolated the bacillus of Nicolaier in pure culture. The method of isolation depended upon two important facts not previously known: First, that the spores of the tetanus bacillus were resistant to heat; and second, that the bacillus could not grow in an atmosphere containing oxygen.

The tetanus bacillus of Nicolaier and Kitasato is a rather long, slender, actively motile bacillus, with rounded ends and a characteristically large, round spore, situated at the end, so that the spore-containing bacilli resemble "drum-sticks," or rather pins.

The bacillus grows well in the ordinary culture media, *provided means are taken to entirely remove and withhold oxygen from the cultures.* Its growth is most rapid at 36° to 38° C., and is accelerated by the addition of 2 per cent. of grape sugar. The cultures give off a horribly offensive odour, somewhat resembling onions. In the cultures, especially when grape sugar is present, there is a copious generation of gas.

The bacillus is not very resistant to heat, but its spores can resist 80° C. maintained for an hour. They are, however, killed in five minutes by a temperature of 100° C. They are not susceptible to germicides, and resist 5 per cent. carbolic acid for ten hours; in fifteen hours they are killed. Kitasato found that 5 per cent. carbolic acid, with the addition of 0·5 per cent. of hydrochloric acid, was fatal to spores in five hours.

The colonies formed by the bacillus in its growth are quite characteristic. Upon the surface of gelatin plates they somewhat resemble those of the bacillus subtilis, but are more pronouncedly filamentous. In gelatin punctures the growth takes place low down in the tube, and consists of a central stalk from which innumerable fine branches are given off at right angles. The effect of this branching may be compared to a miniature fir tree. The gelatin is slowly liquefied, the bacilli accumulating as a turbid precipitate at the bottom of the tube. A similar growth without the liquefaction occurs in thin 1 per cent. agar-agar. In both gelatin and agar-agar

[1] Deutsche med. Wochenschrift, 1889, No. 31.

the gas production becomes very evident from bubbles that form in the media.

Pathogenesis and Modes of Entrance. — From the experiments of Nicolaier, already quoted, it seems that the tetanus bacillus is a widespread saprophyte, living in the upper layers of the soil. It was formerly supposed that the bacilli which were found most plentifully in garden soil —*i.e.*, manured soil—were derived from the dung of the horse. This seems, however, not to be the case, for Le Dentu has found that in the New Hebrides, where there are no horses, the soil is rich in tetanus bacilli.

How the tetanus bacillus, which is an obligatory anaërobic bacterium—that is, one that cannot live where air is present—can live in the upper layers of the soil exposed to the air, is an interesting and puzzling question. The only solution of the problem is to suppose that it grows in the soil as in the pus of wounds—in combination with some bacterium that rapidly absorbs oxygen.

Most warm-blooded animals are susceptible to the disease,—the horse, the ass, the white mouse, and the guinea-pig especially so. Dogs are not killed by considerable-sized doses of the poison or of cultures of the bacilli. The majority of birds are immune. Frogs are said to become susceptible when their body temperature is elevated.

The bacillus probably enters the body in nearly all cases through wounds that are made by objects previously soiled with earth, or pus from infected wounds, or wounds subsequently exposed to infection from these sources. The word earth, however, must not be interpreted to mean either fresh earth or soil only; it can be applied with equal readiness to various dust, as that in hay-lofts, which consists largely of pulverised soil, and for this reason must include also a large part of the dust of stables as well. The simple entrance of the tetanus bacillus may not be enough in itself to produce tetanus. This has partly been shown by Vaillard and Rouget, who found that when the tetanus bacilli were introduced minus their toxin they were promptly taken up by the phagocytic cells of the body and destroyed. If, on the other hand, the toxin was simultaneouly introduced, or the tissues damaged by lactic acid or other chemical substances, the body-cells were injured and the bacilli were able to grow. The ability to grow in the body seems to depend upon one or the other of two conditions: Either the bacilli must enter a portion of tissues in which there is little or no oxygen—*i.e.*, where the blood-supply is feeble or poor—or its entrance must be accompanied by some other micro-organism whose marked affinity for oxygen shall absorb all contained in the tissues so rapidly as to allow the tetanus bacillus to grow. The absence of these requisites probably explains why so many wounds inflicted with earth- and dust-soiled instruments are not followed by tetanus.

The inhibiting effect of oxygen upon the growth of the tetanus bacillus prevents the distribution of the organism throughout the body of the infected animal. The microbe is only found at the point of original inoculation. At this point, however, but little change (sometimes none) can be observed. There is, of course, the wound and in most instances a small area of suppuration, possibly caused by the tetanus bacillus itself, but more probably by other simultaneously introduced bacteria.

Seeing that the local lesion caused by the tetanus is of insignificance, and that the micro-organism does not disseminate throughout its host, we are led to the conclusion that the disease-producing capacity of the

bacterium resides in the so-called poison that it elaborates. This is now proven to be correct.

Kitasato found that if mice were inoculated with tetanus at the root of the tail, and, after a short time, the skin and surrounding tissues were excised or burned out, the eradication of the infected area would not save the animal's life *unless the operation was performed within an hour after the inoculation had been made.* Remembering that the development of the bacilli is a local one, and that they cannot live in tissues provided with free circulation, or in the blood, we are obliged to conclude that the death of the animals depended solely upon the toxin they elaborated. Similar to these results of Kitasato are those of Nocard upon sheep.

The rapidly fatal action of the toxin has led some to suppose that it is an enzyme or ferment—*i.e.*, is capable of increasing in the body of an animal into which it is injected. This is a matter exceedingly difficult of demonstration, and has not yet been proven. Toward the fatal termination of the disease the amount of toxin in the blood is sufficient to be demonstrable by introducing some of it into other animals.

BLACK-LEG OR QUARTER-ILL.

ABSTRACTS FROM A REPORT BY VICTOR A. NORGAARD, V.S., COPENHAGEN,
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Preventative Vaccination.—To Arloing, Cornevin, and Thomas belong the honour of first discovering that animals may be protected against blackleg by inoculation with more or less virulent material obtained from animals which have died from blackleg. They found that the hypodermic injection of minimal doses of fluid from a blackleg tumor did not necessarily result in death, but frequently produced a mild attack of the disease, unaccompanied by any swelling, and that animals treated in that way were afterwards possessed of a very high degree of resistance against the disease. There are, however, few diseases where the individual susceptibility varies to a greater extent than is the case in blackleg, and, as it was impossible to ascertain beforehand the degree of susceptibility or power of resistance possessed by each animal, the exact dose to employ in each case could not be determined, and the method was abandoned as being too dangerous. Even when the inoculation was made at the extremity of the tail it frequently resulted in the development of a swelling which spread to the rump and killed the animal, or else the tail became gangrenous and dropped off.

When the virus, either fresh from a tumor or dried, is introduced into the blood-stream or into the trachea, the animal shows great resistance to its effect and subsequently becomes immunized. It is, however, rather difficult to inject the virus either into the jugular vein or into the trachea without infecting the surrounding connective tissue, and the technique of the operation is too complicated to be of practical value when large numbers of cattle are to be vaccinated. Nevertheless, the French scientists practiced it on five hundred animals with one death only resulting from the operation.

Attenuated Virus.—Prolonged exposure to a high temperature serves to attenuate the virulence of either fresh or dried virus. The fact was employed by the above-mentioned authors for the preparation of a vaccine

which may be used in everyday practice with little danger of injuring the cattle. The material used for the vaccine is obtained from a fresh blackleg tumor, by pounding the muscle tissue in a mortar with the addition of a little water, and squeezing the pulp through a piece of linen cloth. The juice is spread in layers on plates and dried quickly at a temperature of about 35° C. This temperature does not in the least affect the germs, and the dry virus obtained in this way retains a high degree of virulence for a couple of years or more.

When vaccine is to be prepared, the dried material is pulverised and mixed in a mortar with two parts water until it forms a semifluid homogeneous mass. This is spread in a thin layer on a saucer or glass dish, and placed in an oven, the temperature of which may be regulated with exactness. The reason for mixing the virus with water is to insure a quicker and more uniform attenuation. The temperature of the oven is previously brought up to 100° to 104° C., and the virus is allowed to remain in it for seven hours. When removed, it appears as a brownish scale, which is easily detached from the dish. This scale is pulverised and mixed with water, and when inoculated under the skin of calves in doses of 1 centigram per head it produces partial immunity. Subsequent inoculation with virus which has been heated for the same length of time, but at a temperature of 90° to 94° C., serves to re-enforce the immunity. The inoculation is followed by insignificant symptoms. In a few cases there is a slight rise of temperature, and by close observation a minute swelling may sometimes be noted at the point of inoculation. Eight or ten days are allowed to pass between the first and the second inoculation. For reasons already explained, the vaccine is injected at a place where the subcutaneous connective tissue is dense and unelastic, generally at the extremity of the tail or the external surface of the ear, as far from the base of either organ as possible. The immunity conferred in this way lasts for at least eighteen months, but animals which are vaccinated before they are one year old should be revaccinated the following year.

This method of vaccination for blackleg, popularly known as "the French method," "Arloing's method," or the "Lyons method,"[1] was first introduced in 1883, and was generally adopted the following two years. Several thousand cattle were vaccinated in France, Switzerland, and Germany, and the results were highly satisfactory. The operation, however, is very cumbersome on account of the great density of the subcutaneous tissue of the tail, which makes it difficult to insert the needle; in fact, it is necessary first to punch a hole with a strong trocar and loosen the skin sufficiently to form a sack or pocket large enough to receive the vaccine. Afterwards a ligature is tied around the tail to prevent the vaccine from escaping through the hole, and this ligature must be removed a short time after, so as not to interfere with the circulation. When the inoculation is made too close to one of the joints the needle is liable to wound the cartilaginous disks, and cause the formation of an abscess, which may result in necrosis and the dropping off of the tail. In any case, the operation has to be performed by an expert, besides requiring considerable time. Consequently, when large numbers of cattle were to be vaccinated the method was both expensive and inconvenient, and when a modification was suggested it was eagerly accepted. In 1888 Professor Kitt, of the Veterinary College in Munich, Bavaria, took up the question, and, after experimenting

[1] The laboratories of Arloing, Cornevin, and Thomas are located at Lyons, France.

with Arloing's vaccine on a number of animals, came to the conclusion that the second vaccine may be injected alone without any danger to the animal, and that such a single vaccination confers immunity against subsequent attacks of the disease. He went even further and prepared a vaccine which was heated for six hours only at a temperature from 85° to 90° C., which as compared to Arloing's second vaccine (90° to 94° C. for seven hours) was considerably stronger, but which he proved by experiments to be free from danger, even when injected in doses tenfold larger than those ordinarily used. A single injection with this vaccine was found to produce complete immunity when treated by subsequent inoculations with fatal doses of blackleg virus. He further modified Arloing's method by making the injections in the shoulder region, where the skin is loose and easily pierced by the needle. For the preparation of the vaccine Kitt employed the affected muscles from a fresh blackleg tumor, which he cut in thin strips and dried at a temperature of 35° C. and then pulverized in a coffee mill. This process in the manufacture of the vaccine was also an improvement on Arloing's method, which, as will be remembered, consists in pressing the juice from a blackleg tumor and drying it on plates.

In his publication on this matter Kitt recommends that experiments be made on large numbers of cattle with injections of Arloing's second vaccine—in the shoulder region—and that the results be published for the benefit of others who might wish to employ this much quicker and more convenient method. He adds that before vaccinating a large number of animals the vaccine should be tested on guinea-pigs or on a few head of young cattle to ascertain the quality of the material.

Acting on these suggestions, a number of veterinarians undertook vaccinations with second vaccine alone, and in most cases the results were equally satisfactory to those obtained through double vaccination. In Algeria, M. Bremond vaccinated 4000 head of the half-wild range cattle with second vaccine alone, making the injections behind the shoulder. The subsequent loss from blackleg was even smaller than that reported in Europe as resulting after double vaccination, but it must be remembered that the range cattle of Algeria are very resistant to blackleg.

Subsequently a stronger vaccine, as recommended by Kitt, was prepared at various veterinary institutes—for instance, at Edinburgh, Scotland—but it proved to be too strong. The vaccine was heated for six hours at 90° C. and was proved experimentally to be harmless; but in one instance, when used on 15 head of cattle, it caused 5 to die in the course of three days, and 2 more died three to four weeks after vaccination, from typical blackleg. This highly unfavourable result cannot well be explained. It is generally conceded that when the vaccine is strong enough to cause one or more cases of blackleg as a result of the inoculation, the surviving animals must be strongly fortified against subsequent infection. In this case, however, 2 of the vaccinated calves died of typical blackleg at a time when, for obvious reasons, the disease could not be attributed to the operation.

This experience caused considerable prejudice against protective vaccination for blackleg, which later experiments failed to dispel, and up to the present time the method has never become popular in Scotland and England. In the meantime double vaccination in the shoulder region had been very generally accepted as preferable to inoculations in the tail. M. Strebel stated in 1892 that 40 to 45 animals may be vaccinated in an hour by the former method, and also that of a total of 13,022 animals treated by this method only 5 head, or 0·038 per cent. died directly from the inocu-

lation, while the immediate loss among cattle vaccinated on the tail amounts to twice as much. Out of a total of 158,579 vaccinated animals (both methods) 493 head, or 0·31 per cent., died from spontaneous blackleg; that is, the vaccination had in these cases failed to produce immunity, On the other hand, the loss among 106,787 unvaccinated animals amounted to 2049 head, or 1·92 per cent.—more than six times as great as among the vaccinated ones. These results were highly satisfactory, and proved that preventive inoculation with attenuated virus was a safe and effective remedy against the disease. It was furthermore observed that blackleg occurred with less frequency among the unvaccinated cattle in pastures where vaccination was practiced to some extent for a number of years. This is the natural result from a decrease in the infectious material which is ordinarily deposited in pastures where no vaccination is practised. The fewer cases of blackleg, the less opportunity for reinfecting the ground.

About 1890 or 1891 Professor Kitt published the results of a series of experiments which he had undertaken for the purpose of producing a vaccine which would confer absolute immunity in a single inoculation and still be considered safe. Although the grand total of vaccinations up to that time was extremely satisfactory, there were several instances recorded where a high percentage of individual herds had died as a direct result of the vaccination. The statistics also indicated that a certain number of the vaccinated animals failed to become immunized, and died later from spontaneous blackleg (0·37 per cent). The new vaccine prepared by Kitt had been exposed to streaming steam of a temperature 98° to 102° C. for about six hours, at the end of which time the virulent pulverized meat was sufficiently attenuated to be inoculated in comparatively large doses into guinea-pigs, sheep, and calves without fatal result, while producing a high degree of immunity. The preparation of this vaccine is very simple, but the product varies considerably in strength, and before being used in practice it is necessary thoroughly to test it on a number of sheep. Guinea pigs are very unreliable for this purpose, and cattle are not easily obtained for such experiments in sufficiently large numbers.

This vaccine, known as Kitt's dry vaccine (to distinguish it from a fluid vaccine which he prepared later), was extensively used in many countries in Europe, and according to statistics published in 1893 the results obtained with it were better than those obtained by double vaccination on the tail, and nearly as good as from double vaccination on the shoulder with Arloing's vaccine. The question remaining was, therefore, whether a single or a double vaccination was to be preferred. Although he was the originator of the single-vaccination method, Professor Kitt did not claim it to be superior to Arloing's method, as repeated inoculations necessarily must re-enforce the power of resistance; but he thinks that the same degree of immunity can be obtained with a single inoculation with his dry vaccine as with a double vaccination with the French vaccine. More recently Professor Kitt has prepared a vaccine from pure cultures of the blackleg bacillus; but, as will be seen from the table below, its protective value was comparatively low, and consequently it was never used very extensively.

At the International Veterinary Congress in Berne, Switzerland, in 1895, Professor Strebel published the total results from vaccination for blackleg, compiling all the statistics which he had been able to obtain. They cover the period from 1884 to 1895, and embrace the various methods of inoculation already mentioned.

Methods of Vaccination, total number vaccinated, and Accidents after Vaccination in Europe.

Method of vaccination.	Number of Animals vaccinated.	Accidents.					
		Deaths from vaccination.	Deaths per thousand.	Deaths from natural blackleg after vaccination.	Deaths (per cent.)	Combined losses.	Per cent.
Double vaccination on the tail, .	325,893	188	0.56	1,245	0.38	1,433	0.44
Total vaccinations in shoulder region,	91,066	77	0.84	365	0.40	441	0.48
Double vaccination in shoulder region,	37,410	8	0.22	157	0.42	165	0.44
Single vaccination with Kitt's dry vaccine, ...	39,084	61	1.56	187	0.48	248	0.63
Single vaccination with Kitt's pure-culture vaccine, ...	5,643	8	1.41	81	1.43	89	1.58
Total, ...	499,096	341	0.68	2,035	0.40	2,376	0.47

The total shows that nearly half a million head of cattle were vaccinated, and that the loss resulting from the operation, together with the number of deaths from blackleg contracted naturally subsequent to inoculation, amounts to less than one-half of 1 per cent. In order fully to appreciate the protective value of the vaccine it is necessary to compare the mortality among vaccinated animals with that of unvaccinated ones under the same circumstances. To this end Strebel furnishes the following figures: Of the cattle treated with double vaccination on the tail, 129,705 were pastured together with 245,560 head of unvaccinated stock. Of the former 550 head, or 0·42 per cent., died from spontaneous blackleg, while 4136 head, or 1·76 per cent., of the latter died from blackleg. The mortality among the unvaccinated animals was consequently four and one-half times greater than among those vaccinated.

Of the cattle vaccinated in the shoulder region 62,158 were pastured with 82,334 head of unvaccinated cattle. The respective losses from blackleg amounted to 282 head, or 0·45 per cent., in the former, and 1350 head, or 1·64 in the latter. Mortality among unvaccinated was three and three-fifths times greater than among those vaccinated. Of the animals which received a double inoculation in the shoulder region 25,849 were pastured with 13,452 unvaccinated animals. Of the former 119 head, or 0·46 per cent., and of the latter 321 head, or 2·38 per cent., died from blackleg; difference in mortality five times greater among unvaccinated stock. Of the animals treated with Kitt's single vaccine 30,123 were pastured with 57,867 unvaccinated cattle. Eighty-five head, or 0·28 per cent., of the former died from blackleg, while the loss among the latter was 921 head, or 1·59 per cent., or nearly six times greater. The results from Kitt's pure-culture vaccine show a loss of 1·58 per cent. among the vaccinated animals, while the loss among 13,183 unvaccinated cattle in the same pasture amounted to only 1·45 per cent.

It appears from these statistics that vaccination in the shoulder region is not quite so safe as vaccination on the tail, especially when the inoculation accidents are included; while, on the other hand, the single vaccination on the shoulder with Kitt's dry vaccine confers the highest degree of immunity. His pure-culture vaccine, however, was very unsatisfactory.

In 1896 M. Strebel stated that the percentage of inoculation accidents

had increased during the previous year from 0·028 per cent. to 0·724 per cent., or twenty-two times higher than the record for eleven years. This he attributed to a less attenuated vaccine which, at his own request, had been prepared by Arloing and Cornevin. The unfortunate results caused the Swiss Government to order an investigation for the purpose of determining the best preparation for blackleg vaccine. A double vaccine was prepared at the Veterinary College in Berne, while the laboratories at Lyons furnished an equal amount of their double vaccine for comparison. Of the 4202 vaccinations not less than 123 animals died from inoculations for blackleg, by far the greatest percentage falling on the Berne vaccine, and especially on animals which had been vaccinated in the shoulder region. As a result of these experiments the Swiss authorities again abandoned the latter method and returned to the slow and cumbersome inoculations on the tail.

The Bureau Vaccine.—As already stated, experiments were begun in the Pathological Laboratory of the Bureau of Animal Industry in the fall of 1896 for the purpose of preparing a blackleg vaccine which by a single inoculation would produce practical immunity and still be sufficiently attenuated to cause only a minimum amount of loss at the time of inoculation. All the various methods already mentioned were tried, and it was finally decided to adopt Arloing's principle with Kitt's modifications. The finely ground and sifted blackleg meat was heated in moist condition for six hours at a temperature of 93° or 94° C. and the dried crust pulverized and divided in packets containing ten to twenty-five doses each. It was found that heating to 90° C. for six hours, as recommended by Kitt, did not attenuate sufficiently to make the vaccine safe in all instances. The same was the case with virus heated at 91° and 92° C.

To insure absolute uniformity of temperature, a special oven provided with a 3-inch oil jacket was constructed, and the vaccine produced gave, so far as could be ascertained by numerous inoculations, such uniformly good results that it was decided to place a limited number of doses in the hands of reliable stockmen in order to have them test it in practice on their cattle.

Table showing for eight States the number of Cattle vaccinated and the percentage of loss before and after vaccination.

State.	Number of Reports.	Number of Cattle vaccinated.	Average Annual Loss from Blackleg.	Deaths same Season but previous to Vaccination.		Died after Vaccination.					
						Within 48 hours.	From 3 to 7 days after.	Within 1 year.	Number of Cases admitted to be due to mistakes.	Total number.	Per cent.
			Per cent.	*Number.*	*Per cent.*						
Texas, . .	164	50,609	13	1,462	2.95	20	7	141	59	227	0.45
Nebraska, . .	71	20,893	17.2	796	3.80	7	1	39	5	52	0.25
Kansas, . .	140	19,508	11	919	4.76	36	24	52	3	115	0.58
Colorado, . .	53	12,609	12.8	230	1.83	6	8 (?)	120 (?)	4	138	1.09
Oklahoma, . .	37	7,915	17.5	471	5.96	2	—	20	15	37	0.47
Indian Territory,	20	7,418	17.5	504	7.81	—	—	51	44	95	1.28
North Dakota, .	22	6,118	12.75	133	2.18	—	—	25	—	25	0.41
South Dakota, .	15	2,299	12.75	74	3.32	1	1	7	2	11	0.48
Total, .	522	127,369	14	4,589	3.63	72	41	455	132	700	0.54

These figures, as will be seen, are based upon the reports received from 522 stock-owners who vaccinated about 127,000 head of cattle. The average loss from blackleg in these eight States and Territories was estimated in the reports to be 14 per cent. This percentage, as already stated, is based upon the losses sustained in well-known blackleg districts and not upon the total number of cattle in each State, and refer, of course, to unvaccinated herds. At least 90 per cent. of the 522 stock-owners lost cattle from blackleg previous to vaccination, and the actual number of deaths reported to have occurred during the same season before the cattle were vaccinated amounts to 4589 head, or 3·60 per cent.

After vaccination 700 head died. These may be classified as follows: —72 head died within forty-eight hours after vaccination and cannot justly be charged to the effect of the vaccine. In every one of these cases the owner reported that he was losing cattle every day before vaccination, and the period of incubation for blackleg being from two to five days, it is reasonable to assume that these animals were infected before being treated. Consequently they should be left out of consideration in judging the effect of the vaccine. Forty-one head died in from three to seven days after vaccination. It would doubtless be safe to consider these cases as being due to the immediate effect of the vaccine, and to term them cases of inoculation-blackleg.

During the year following vaccination 587 head died from blackleg. In 132 of these cases the owners admit to having made one or more mistakes, either in the preparation of the vaccine or in injecting it. A number also state that the animals which died were under five to six months old when vaccinated, some being only two to four months old. Mistakes are no doubt also responsible for some of the 455 deaths, but only in cases where the owners expressly state that such occurred have the deaths been classified in the column headed "mistakes." Take, for instance, the large number of deaths reported from Colorado—138 cases. Only 4 of them are acknowledged to be due to mistakes, while 6 died within two days after vaccination. Of the remaining 128 cases, 52 head, or nearly half, were lost by one man who vaccinated 1700 head. In reply to question 18 on the inquiry blank this man states that he used Pasteur vaccine the year previous with the same result. This is an equal loss of 3 per cent. with either single or double vaccine, and indicates that either some abnormal conditions obtain in that neighbourhood, or else the same mistake in using the vaccine was made in both cases.

Another stock-owner in Colorado, who vaccinated 600 head, says that he lost 17 from blackleg three months after vaccination. Evidently the number of cattle failed to become immune from the vaccination. He states, however, that in withdrawing the syringe after making the injection a part of the fluid escaped. This cannot occur when the directions are followed, and, as no complaints were received from any of the other stock-owners who obtained vaccine from the same lot, the writer is inclined to believe that the unsatisfactory result cannot be charged against the vaccine. A third stock-owner vaccinated 2350 head and lost 24 head during the following winter. In reply to question 18, he states that he has also used the Pasteur vaccine, and that the subsequent loss among the vaccinated ones was equally as great as among those which had not been vaccinated at all. These three cases account for 93 of the 128 deaths, leaving but 35 deaths among the remaining 7959 vaccinated animals, or 0.44 per cent.

The Indian Territory also figures in the table with a very high percentage of deaths which occurred several weeks after vaccination. Of the 95 which died, 40 belonged to one man, who states that he lost a quantity of vaccine by working in "too much of a rush."

ARKANSAS AGRICULTURAL EXPERIMENT STATION, JUNE 1899.

The Relative Virulence for the Domestic Animals of Human and Bovine Tubercle.

BY ROBERT R. DINWIDDIE, M.D.

(*Continued from page* 466—1899.)

We may now attempt an analysis of these results in order to see what conclusions they lead to, and to what extent they harmonise with the results of the previous investigations of the same kind brought together in the first part of this report.

In the case of cattle, a striking feature of these experiments is the insignificance of the lesions induced by the various inoculations of both human and bovine crude tubercular material. With one exception these were so slight as hardly to afford sufficient basis for instituting a comparison of the pathological-anatomical changes in the two series. With sputum or with cultures from sputum no disease was obtained equal in extent to anything except the mildest form of natural infection. Feeding was entirely ineffective. Inoculation gave rise to slight lesions on surfaces reached by the injection fluid—local lesions. These, however, were specific so far as they went. The tubercles, minute and calcareous, and the peculiar fibroid new formations, also minute, on the abdominal serous surfaces, are not effects such as might result from the injection of any irritant fluid. The former may, indeed, be compared to the effects of dead tubercle bacilli, such as have been observed by several writers (Prudden and Hodenpyle; Stockham), but the latter, as well as the fringe formations with which they are associated, I regard as the incipient stage of the peculiar form of tuberculosis of cattle, the so-called "Grape disease." Support for this view is found in the occurrence of transitional forms between the minute growths, apparently purely fibrous and destitute of tubercles, and the large grape-like tubercle-containing masses of the natural disease. These, in the form of pea-sized polypoid growths, were found in calves inoculated with sputum as well as with bovine material. Further, all of these growths except the most minute have a calcareous necrotic center; histologically they do not markedly differ from the larger masses, and if sufficient time be spent on the search, a demonstration of tubercle bacilli can generally be made.

We may, therefore, look upon these lesions found in the sputum-infected cattle as representing an interrupted or abortive development of grape disease. To what is this abortive or nonprogressive character of the disease to be attributed? Manifestly not entirely to a difference in kind of pathogenic action between the human and bovine virus, since two of the calves inoculated with the latter presented lesions differing not in kind, but only slightly in degree or extent from the above. It should be ascribed rather to the inherent disease-resisting power of the animal organism, forti-

fied in the case of these experimental animals by the absence of all confinement in stables, for, in my opinion, defective ventilation is scarcely less important than contagion as a factor influencing the prevalence of tubercular disease in man and in animals.[1] It should be remembered, too, that the naturally acquired disease in cattle is very rarely acute, and, when the conditions are favourable, seldom even progressive. Tuberculosis in cattle is really a disease incident to domestication, and dependent especially upon the pernicious influence of confinement in stables, for an adequate ventilation of any covered building in which a number of cattle are confined I regard as a practical impossibility.[2]

Comparing the virulence for cattle of the samples of human and bovine tubercular material used in these inoculations, we may say that the bovine material showed itself of varying activity, but on the whole more virulent than human sputa. In one sample this excess of virulence was marked, in the others only slight. This excess of virulence was brought out more prominently in cultures in the one comparative test made.

Pigs.—These animals are susceptible to infection with both human and bovine tubercle. For reasons already given, but one sample of each has been tested in such a way as to make the comparison a just one, and, judging from this test, bovine tubercle is no more active for these animals than human sputum. The kind of pathological changes induced in the two cases are identical. The liability to generalisation of the disease in pigs, a feature which has been noticed by other observers, is noticeable also in these inoculation experiments.

Sheep are evidently highly susceptible to bovine tubercle bacilli. My one experiment on this species is insufficient to justify a positive verdict as to their susceptibility to human tubercle bacilli.

Chickens showed themselves equally refractory to both. The inoculation of relatively large doses of recently isolated and vigourously growing cultures never occasioned even local lessons.

General Review.

The facts presented in the foregoing pages admit of profitable study and analysis from more than one point of view, but it is sufficient to consider them here only in so far as they constitute evidence on the subject of this inquiry, namely, the relative pathogenic activity of human and bovine tubercle for the various species of domesticated animals. Although some few facts are available in regard to most of these species it is only in the case of cattle that this evidence is at all extensive. In other animal species (with the exception of guinea-pigs and rabbits) it is so meager as to be hardly more than suggestive. It is, however, in the case of cattle that the question possesses its greatest practical importance and, therefore, demands the most consideration.

We may present the matter to be determined (as far as the evidence will allow) in the form of three questions:

1. Is tubercular disease communicable from man to cattle?

[1] The influence of repeated injections of tuberculin in modifying the course of tuberculosis in cattle is entirely conjectural and based, so far, on no evidence of scientific value.

[2] And yet tuberculosis is very rife among Australian cattle, which are never under cover.—*Ed. V. J.*

2. If so, is the disease thus induced similar in kind to the naturally acquired tuberculosis of cattle?
3. Other things being equal, is the susceptibility of cattle equally great for the human and bovine tubercular virus?

The first question can hardly be said to be in dispute, nearly all experimenters who have inoculated human tubercle or cultures to cattle having obtained at least a local development of tubercular lesions.

As to the second question—the identity in nature of the lesions induced by infection of cattle with human and bovine tubercle—the evidence furnished by the experiments of such pathologists as Klebs, Kitt, Bollinger, Baumgarten and Crookshank, not to speak of others of less note as histologists, seems to be irrefutable in establishing the fact that the lesions peculiar to cattle tuberculosis in its most typical form, the fibro-tubercular masses of "grape disease," are attributable to a peculiarity in the mode of reaction of the organisation of cattle against the tubercular virus rather than to any peculiarity inherent in the bovine tubercle bacilli as distinguished from the human variety. My own experiments, both with calves and pigs, seem to afford confirmatory evidence of the correctness of this view.

The question of the relative susceptibility of cattle to human and bovine tubercle is not one of recent origin, since it is involved in the question as to the identity of tuberculosis in man and cattle, which was one of the first objects of inquiry by those who sought to establish the contagious nature of this disease.

The etiological identity of the disease in man and cattle, first suggested by the similarity of the lesions, and then more forcibly by the results of inoculation of rabbits and guinea-pigs, received first its apparently complete confirmation by the experiments of Chauveau. His experiments afford evidence not only of the identity of the disease in the two species, but of a susceptibility of cattle to human tubercle equally as great as to the bovine virus. They have one disadvantage, however, in the fact that they stand alone. No other investigator, so far as I can find, has ever obtained even a distinct infection of cattle by feeding human tubercular material, although the experiment has been repeated a number of times. The reputation of Chauveau as an investigator is, however, a guarantee of the accuracy of these experiments, and the difference in the results of his experiments and those of others who have made the same test may be due to conditions of environment, or even to an unsuspected extraneous infection of his cattle.

With this exception, all comparative tests which have been made show a greater susceptibility of cattle for the tubercular virus of bovine than of human origin. A study of the results of those experiments, much more numerous, which were not comparative, leads to the same conclusion. A certain degree of susceptibility of cattle towards human tubercle is clearly shown by many inoculation experiments, especially intra-peritoneal, but the infection experiments with bovine tubercle have been more generally successful and led to more extensive disease. Pütz seems to have been the first to demonstrate this difference in virulence, and attaches to it, as we have seen, more importance than will be generally conceded. Smith has shown that this difference is even more clearly brought out by the use of cultures, and, finally, my own experiments, both with the natural disease products and (more strikingly) with cultures, admit of a similar interpreta-

tion. It seems, therefore, that it may be laid down as a rule that cattle are more susceptible to the tubercular virus of their own kind than to that of man, as represented by the excretions of pulmonary tuberculosis and cultures from the same. To this rule further investigation may show that there are exceptions. Just as there are apparently races of tubercle bacilli of man possessing different degrees of pathogenic power, so there may be races of unequal activity in cattle. The samples of bovine tubercle tested in my experiments, for instance, seem to vary in virulence for cattle, although these experiments were not of such a kind as to best bring out racial distinctions. It should also be noted that the human tubercle virus tested on cattle, at least in the more recent experiments—those of Frothingham, Smith, and myself—has been that of only one form of human tubercular disease, namely, pulmonary phthisis.[1]

On the other species of domesticated animals, although comparative tests are few, various feeding and inoculation experiments have been made from which some information may be gleaned.

Horses are susceptible to inoculation with human tubercle (Pütz). Several cases are reported in which infection seemed with great probability to be derived from cattle. Nothing can be said as to any difference in susceptibility.

Sheep, as we have seen, are susceptible to inoculation with bovine tubercle to a degree apparently equal to that of cattle themselves, although the naturally acquired disease in this species seems to be extremely rare. Besides my own experiment a number of successful inoculation and feeding tests are reported in the preceding pages. Attempts to infect sheep with human tubercle seem to have been generally unsuccessful. I have only found one exception (Blumberg, p. 11), and the record in this case is of the briefest.

Goats seem to have a susceptibility similar to that of sheep (Gerlach, Bollinger, Kitt, Semmer).

Swine are readily infected with bovine tubercle. This has been frequently shown experimentally (Gerlach, Bollinger, Toussaint) and still more frequently by observation of natural infection from the use of milk of diseased cows. Few tests seem to have been made on these animals with human tubercle. Two instances of infection are, however, recorded (Blumberg, Bollinger) besides my own. So far as the evidence goes they seem to show no difference in susceptibility towards human and bovine tubercle.

Dogs and *cats* also show a susceptibility to the virus of both sources. With bovine tubercle successful experiments are reported by several writers (Scholtz, Viseur, Semmer, Toussaint) and with human tubercle by one (Bollinger). There are, however, numerous observations of fatal infection of these animals by ingestion of human sputa.

Poultry, as is well known, are highly resistant to infection with mammalian tuberculosis. However, Nocard and others have observed instances of what appeared to be natural transmission from feeding on human tubercular sputa. Nocard's recent successful transference of mammalian tuberculosis to poultry were made with material of human origin.[2]

[1] Both Klebs's and Kitt's intra-peritoneal inoculations seem to have been made with material derived from scrofulous glands.

I have at present under weigh some experiments with scrofulous material which I hope to report on later,

[2] Annales de l' Institut Pasteur, 1898, page 561.

In my experiments, infection was not obtained with cultures of either source. That they are not readily infected by contagion from cattle is also shown by the absence of all observations of this kind in spite of the unlimited opportunities for contagion afforded by the manner in which poultry are raised, in this country at least, in association with cattle in stable and yards.

Rabbits have been found by many observers, even back to the time of Villemin's early inoculations, to be more susceptible to cattle than to human tuberculosis. In *guinea-pigs* this distinction is less recognisable on account of their extreme susceptibility to both forms. Klein and Gibbes (p. 14) concluded from their experiments that these animals were most susceptible to the human virus, but this observation finds no support from other investigators.

To sum the matter up in a few words it may be said that bovine tubercle has been shown more virulent than the human variety for cattle, sheep, goats, and rabbits, while no distinction has been shown in the case of horses, pigs, cats, and dogs.

Before leaving the subject some allusion should perhaps be made to its practical aspects.

In animals other than cattle, tuberculosis is of such rare occurrence that the source from which they receive the contagion is a matter of minor importance. In all animal species we must concede the possibility of a transmission from one individual to another in the same herd, but it is only in the case of cattle (and poultry) that this probably occurs to any extent. In other species such as horses, sheep, goats, dogs, and cats, sporadic cases only occur in which an extraneous source of infection human or bovine can often be traced. In pigs, tuberculosis seems to be due usually to the ingestion of milk from tuberculous cows. In some cases, such as in herds fed with hotel swill, we can easily suppose a human origin as well. Whether the disease is liable to be spread and perpetuated in a herd by infection from animal to animal seems to be as yet undetermined.

As to the transmissibility of tuberculosis from man to cattle under natural conditions, this event, from the evidence which we have now obtained of the comparatively feeble susceptibility of cattle towards human tubercular sputa, must be regarded as unlikely. It can hardly be said that this evidence amounts to proof of the absolute impossibility of such transmission under a combination of favouring circumstances, but, evidently, such an occurrence must be so rare as hardly to constitute an obstructive factor in any means adopted for the eradication of cattle tuberculosis. So far as contagion is concerned that derived from other diseased cattle would appear to be practically all that need be guarded against, provided that other sanitary measures are not neglected. I may here state my conviction, strengthened by what these latest experiments disclose, that no means which stop at a mere attempt at avoidance or destruction of contagion will ever result in a permanent suppression of tuberculosis in cattle or greatly reduce its prevalence in mankind. That contagion in the form of tubercle bacilli is an essential factor in tubercular disease no bacteriologist will attempt to dispute, but the influence of predisposing causes should not on that account be underestimated. Of these I attach the most importance to defective ventilation—breathing of vitiated air. In cattle we find the proof of this in the rarity, practically the absence, of tuberculosis among the herds of unstabled cattle in the south-west of our own country, and in other

countries where similar conditions prevail. Further than this a spontaneous eradication of the disease from an infected herd may occur when the pernicious influence of stabling is removed. Although possessing little opportunity for making observations of this kind, I have myself knowledge of one instance in which this occurred, and can readily believe that it may be of frequent occurrence.

It is not my purpose here to enter on the question as to how this great agricultural problem—the limitation or suppression of bovine tuberculosis—should be approached, but whether by radical or by temporising methods, it is certain that these should be supplemented by some measures calculated to counteract the evils of unsanitary cow stables. In relation to human tuberculosis also it may not be out of place to state that even at this day there is ample room for missionaries to preach the gospel of pure air.

A discussion of the transmissibility of tuberculosis from cattle to mankind, really the most important question in connection with bovine tuberculosis, is beyond the scope of this article, but it is not out of place here to point out in what way the facts now obtained may tend to modify our views on this subject. The generally assumed transmissibility of the disease to man by the use of milk from diseased cows, rests mainly on a speculative basis, and its importance is variously estimated by pathologists. It cannot be said that the facts here presented remove the question in any degree out of the domain of speculation. They really furnish more food for theorising, and may either diminish or increase our suspicion of dairy products according to the process of reasoning employed. It may be argued for instance, since bovine tubercle bacilli have been shown to be equally as virulent as those of human origin for all animals tested, and more virulent for some, the presumption is that they are more virulent for mankind also. Contrariwise, it may be said that human tubercle bacilli being shown to be less adapted for growth in cattle than the bacilli of bovine origin, there is reason for believing that the converse may also be true. The latter view supposes a permanent racial distinction between the human and bovine bacillus, while, according to the former, the difference in pathogenic power must be attributed to a relatively attenuating effect on the bacillus by passage through the human organism. If the bovine bacillus be regarded as merely a more highly virulent modification of the human variety, this should be shown by the greater gravity of the lesions produced by comparative inoculation experiments in all species of susceptible animals. If, however, there is a selective feature shown by such inoculations, the excess of virulence of the bovine variety being manifested only towards certain species of animals, some support would be gained for the theory of a distinction of races other than that founded on a mere difference in degree of pathogenic activity. It is from this point of view that I have endeavoured to approach the subject in collecting such evidence as was obtainable as to the effects of human and bovine tubercle on animals other than cattle, and in the few experiments I have as yet been able to complete. The evidence so far available is hardly sufficient to risk an opinion upon, but on the whole seems to lend some support to this latter view.

It is, of course, not by inoculation experiments alone that this problem can be satisfactorily investigated, but by these in conjunction with a comparative study of the biological features of artificial cultures. It cannot be

said that any very striking difference in cultural characters have so far been discovered, but some slight distinguishing features have been pointed out by Smith in the article already quoted. This author, the first who has made a comparative study of human and bovine tuberculosis by the use of artificial cultures, arrives, as we have seen, at the same conclusion as some of the earlier investigators in their experiments with the natural disease products, and finds in his researches reason for the belief that the danger of human infection from cattle has been generally exaggerated. This seems to fairly represent the status of pathological opinion at the present time.

Reviews.

THE COMPLETE MODERN FARRIER. By THOMAS BROWN, M.P.S. Edinburgh: John Grant.

This is one of the survivals of a past age, in which books, for the guidance of stock-keepers, country gentlemen, and others were written by non-professional men who arrogated to themselves the idea that they were fit and proper expositors of what was to be done in cases of injury to and sickness of domesticated animals. Its title-page quaintly reminds us of the early part of the present century. "The Complete Modern Farrier" is stated to be "a Compendium of Veterinary Science and Practice, showing the best and most successful Methods for the Prevention of all Diseases to which Farm Live Stock are liable; and showing also the best and most successful Methods for the Curative Treatment of these Diseases; the Subjects dealt with including the Breeding, Management, and Veterinary Treatment of Horses for Draught, Driving, and Racing; the Rules of the Jockey Club; the Breeding, Management, and Veterinary Treatment of Dairy and Feeding Cattle; with full instructions as to the Prevention of Tuberculosis, Abortion, Milk-Fever, and other Bovine Diseases; the Breeding, Management, and Veterinary Treatment of Sheep, Dogs, &c." What more would you have? And all in the comparatively small compass of 757 pages.

We are not familiar with former editions, nor do we know who Thomas Brown, M.P.S., was; but we are told that the present edition is the thirty-first, and that it is "thoroughly revised and in large part re-written, so as to embody all the most up-to-date facts and methods of prevention and treatment known to Veterinary Scientists." Modest in its pretensions, you observe.

We can readily understand that it will appeal to the public for which it is intended, and we can assure the Veterinarian that if he should by any chance come across this cyclopædic work, he might do worse than spend half an hour or so glancing through its pages. He would at least derive amusement, if not instruction.

The pathology, etiology, nomenclature, &c. are strange mixtures of the old and new ideas. Quotations from the moderns—Crookshank, for example—are sandwiched in among theories and surmises that obtained credence when Queen Victoria was young. We do not wish to convey any false impression, however; and therefore we hasten to add that there is much that is good among much that is questionable. Not the least good

feature, from our point of view, is the repeated recommendation that the veterinary surgeon should be called in to deal with difficult cases, and that before it is too late. In addition, the chapters on the breeding and management of stock contain much sound common sense, and if followed by breeders and stock-owners will make for increased comfort and health among farm animals.

The modern method of reviewing a book appears to be to "slate" it as much as possible, and then conclude by some description of the paper, printing, illustration, and binding. We have done our "slating"—and, be it noticed, also our praising—and therefore it only remains that we conclude in the orthodox fashion. The printing is good; the paper quite passable. Fourteen full-page coloured plates lend variety to the pages; these, so far as we can make out, are all from the pencil of the late Mr. Brown, and are good, bad, and indifferent in quality. The binding is somewhat startling—vermilion cover and yellow edges.

OBSTÉTRIQUE VÉTÉRINAIRE, par J. BOURNAY. Pp. 524; 72 figures. Paris: Libraire, J. B. Baillière et Fils. 5 fr.

In 1893, the first volume of the *Encyclopédie Vétérinaire*, edited by Professor Cadéac, made its bow to the veterinary public of France in particular, and the world in general. Since that time succeeding volumes have periodically made their appearance, until the work at present before us constitutes the nineteenth of the series. We may say, we believe without fear of contradiction, that the *Encyclopédie* has been consistently successful, and the present volume will in no way detract from the excellence of the whole. Any practitioner who numbers the different volumes among those on his book-shelves, may count himself fortunate in possessing in a small compass excellent reference books in the various departments of Veterinary Science. One point in which a collection of works such as that comprising this encyclopædia excels the larger manuals, consists in that each subject is treated of by a specialist.

Professor Bournay has succeeded in compressing into the comparatively small compass of 524 pages a mass of material such as might very easily have been spread over a much wider area. His task has evidently been one of selection rather than of expansion, and no fact shows the advance of Veterinary Science in a more striking manner than that the subject of obstetrics now requires a separate volume in which to receive adequate treatment. This is all the more striking if we remember that not many years ago all that was known of obstetrics could be squeezed into a chapter or two at the ends of works treating of the diseases of animals.

The appearance in 1878 of Fleming's exhaustive treatise on Veterinary Obstetrics, was at the time a revelation of the march of progress, and the demand for a second edition some short time ago demonstrated that the British practitioner was alive to the importance of the subject, and that he was not satisfied to blindly follow in the footsteps of his forefathers. Monographs have multiplied in an amazing manner during the last twenty years, and now in the last year of the century we find France adding one more to the list. The conviction that specialism is growing is one of the most encouraging thoughts that we shall carry over from the old to the new century.

Professor Bournay's book exhibits, in a most striking manner, a close resemblance to those dealing with human obstetrics, another indication, we are pleased to think, of the closer knitting together of the sister professions. The work is divided into three parts, in which physiological obstetrics, pathological obstetrics, and the therapeutics of obstetrics are considered.

In the first part (Physiologie obstétricale) the anatomy and physiology of the female generative organs, the development of the fœtus, and the management of normal labour are explained, in a manner at once simple and lucid.

The second part (pathologie obstétricale) treats of the pathology of the female organs, and the abnormalities and accidents attending gestation and parturition.

Obstetric operations are considered in the third part (thérapeutique obstétricale).

The section on milk fever (fièvre vitulaire) will especially appeal to the country practitioner. In a comparatively small space he will find the different theories as to causation and pathogeny of the disease succinctly expounded.

Not the least important feature of the book is the copious references to original papers, &c., which are given at the foot of almost every page. The industrious student will find these of especial value, should he wish at any time to look up the most important writings on any particular subject.

The book is fairly well illustrated, and excellently printed. The price is so moderate that no one, on this head at least, can offer up an excuse for not possessing the work.

We congratulate M. Bournay on the result of his labours, which must have been considerable, and recommend his product to student and practitioner alike.

In Scotland nowadays, fortunately or unfortunately as the case may be, we do not often have cases of Purpura Hæmorrhagica. When we had such cases, we often wished for some specific, and had to content ourselves with chlorate of potash, and later with the iodine injection.

Professor Diekeroff of Berlin has been using argentum colloidale credê with marked success in such cases, and we are looking forward to opportunities to try this treatment, and hope to further report upon it. If any of our readers desire to try it, and we can recommend them to do so, they can obtain the drug and direction from Messrs. Burgoyne, Burbidges, & Co., 16 Coleman Street, London.

In days gone by it was supposed to be impossible to keep horses in good hard condition on anything but oats and hay, but we know differently now. For patriotic and other reasons no oats but home-grown oats were considered of any value, but since the introduction of foreign food stuffs orthodoxy and patriotism have been cast to the winds, and the whole question considered is, What is best and cheapest? We have no hesitation in saying that one of the best substitutes for oats, both as regards value in work power and economy, is "*Zebril.*" This food is a new one in this country, but has been used with great success in Denmark, Germany, Sweden, and other countries, and we recommend students of economical feeding of horses to give it a trial.

A CAUSE OR A COINCIDENCE?

BY HAROLD LEENEY, ESQ., M.R.C.V.S.

In the spring of this year (1899) two healthy dogs were placed with me as boarders. Bobby had been subject to eczema. Spotty had never known any skin trouble. As I had shortly afterwards taken in some cases of the prevalent dog sickness, I determined to place the before-named animals in the gardener's cottage, which happened to be void of a tenant. The weather was hot and the windows of the upper storey left open. Rose trees were trained upon the wall. Spotty, tired of confinement, jumped out of window, breaking her fall in the rose tree. She was a good deal scratched, but not in a manner calling for treatment. In a few days she developed what had all the appearance of eczema of a mild type. I did nothing, as I deemed it to be a simple inflammatory trouble arising out of the rose-bush incident. In another week she had a most intractable skin disease, which, despite the ordinary remedies, took on all the appearances of eczema rubrum or "red mange." Had it been the other dog (her companion) I should of course have regarded it as a return of the skin disease, to which he was known to be prone. If both had it, the diet or management might have been called in question. But Bobby entirely escaped, while Spotty has taken several months to entirely recover. Were the scratches the cause, or was it a coincidence, and why did not the other dog get it?

If my diagnosis had been wrong, and the disease were parasitic, then her stable companion should have contracted it.

My treatment was a compromise. In case it were of parasitic origin, I employed sulph. precip., but, believing it the while to be truly eczematous, anointed her freely with ung. zinci ox. For a long time no progress was made, but the affected area increased. I should have said that the nude parts were the first to suffer, and that the head and all four legs were eventually denuded of hair, and a characteristically offensive odour pertained to her until within a few weeks of her recovery. There was a time when one would almost have indulged an equal hope of growing hair on a deal board as upon her corrugated and moist skin, but she never showed the least inclination either to scratch or rub.

The owner's continued absence abroad enables me now to inform him that his dogs are both quite well and fat, and ready to give him Christmas greetings. What would he have thought of my boarding establishment if he had returned three months sooner? Luck, surely, is a big factor in dog doctoring. I have thought sometimes (if my knees did not knock together in the presence of half a dozen listeners) that I might amuse a Veterinary Medical Association with some remarkable experiences of clients as well as cases, but there seems always to be a good supply of essayists of the very best kind, and even if one succeeded in being amusing, such "divarsions" would not be profitable—from a scientific point of view.

We have made trial of "Wyley's Green Blister," prepared solely from cantharides, and containing no other active ingredient. We like it well, and were it not that we do all our own compounding, we should always use it.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1899.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending December 16th, 1899.

ENGLAND AND WALES.

Pleuro-Pneumonia.	Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Sheep-Scab (for month of November).
None.	Outbreaks 113 Slaughtered 1663	Outbreaks 68 Attacked 105	Dogs destroyed 3	Outbreaks 26 Attacked 36	Outbreaks 239

SCOTLAND.

None.	Outbreaks 4 Slaughtered 114	None.	None.	Outbreaks 19 Attacked 23	Outbreaks 17

IRELAND.

None.	Outbreaks 11 Slaughtered 207	Outbreaks 2 Attacked 2	None.	None.	Outbreaks 71

THE CAMBRIDGE TUBERCULOSIS COMMITTEE.—A committee having for its object the eradication of tuberculosis has been formed at Cambridge, the following being its members:—Chairman: The Professor of Pathology (Dr. G. Sims Woodhead). Honorary Treasurer: The Regius Professor of Physic (Dr. T. Clifford Allbutt). Honorary Secretary: Dr. Sladen. Committee: The Vice-Chancellor of the University, the Master of Downing (Dr. Alex. Hill), the Medical Officer of Health (Dr. Bushell Anningson), the President of the Cambridge Medical Society (Dr. Lawrence Humphry), a member of the County Council (Mr. Alderman G. B. Finch, M.A.), a member of the Town Council (Mr. Alderman T. Hyde Hills), the Secretary of the University Agricultural Department (Mr. T. B. Wood, M.A.), a member of the Veterinary profession (Mr. G. A. Banham, F.R.C.V.S.), and the Professor of Agriculture (Dr. William Somerville) The committee will begin their work by remedying the unsatisfactory state of the Cambridge milk supply.

Our best thanks are due to Messrs. Mackey, Mackey, & Company, Wholesale Chemists, Bermondsey, for including us in the fortunate number of those who receive their Veterinary Diary, which is indispensable to the busy practitioner.

NON-CONTAGIOUS SKIN DISEASES OF DOMESTICATED ANIMALS.

BY W. GRAHAM GILLAM, M.R.C.V.S.

MR. PRESIDENT AND GENTLEMEN—Before reading the paper, I think an apology is due to you for bringing the subject under your notice; it has been the subject of a paper I read a few years ago, though not before the members of this Association. Our President brought his moral persuasion to bear, and I consented on the understanding that I might present a revised edition of the subject for your consideration. I do not presume to bring many new facts or theories to light, but it is a subject with which even the youngest member has made an acquaintance, and should on those grounds alone afford wide scope for a discussion, and which may be the means of bringing forward other and better methods of treatment for the various forms of skin disease which I shall bring under your notice.

The title of my paper needs no definition. I purposely have confined my remarks to the non-contagious forms, so as to avoid entering on the subject of "mange," which is one of so wide a range that it might easily form the subject of another paper, but would make the present one unnecessarily wearisome and irritating.

It was my original intention to have "Eczema" for my subject, but on second thought I deemed it advisable to alter it to the present title—for these reasons. It is a term which is in very general use, and is more often than not very loosely used. Very often used by the ignorant as a cloak for their ignorance, as to them it means nothing more than a skin disease. Eczema is quite as convenient a term for some people as is the word rheumatism, when they are at sea regarding obscure cases of lameness.

The definitions of the word "eczema" are very numerous, literally it means an eruption. Some writers define it as "cutaneous catarrh." The one I consider best is: An inflammation of the skin, remarkable for a multiple series of pathological symptoms and for extremes in development and duration. From this you will see that the classification of the various forms of eczema appears to be very arbitrary, and one finds in consulting works of reference that some forms which are included by some writers are excluded by others and *vice versa*.

Nevertheless I think I shall considerably simplify matters by dealing in the first place with the so-called forms or stages of eczema, viz., erythema, papular and vesicular eczema; moist, pustular and squamous eczema, in this order, and my reasons for so doing are—1st. They are frequently sequels to each other in this order; 2d. It is simpler than dealing with the variously present lesions *in toto;* and 3d. The local treatment varying in many instances according to the lesions presented; and also because they are treated of in this way by one whose admirable work is on the bookshelf of nearly every veterinary surgeon, I mean the late Mr. Finlay Dun. After treating of these, I purpose dealing with the remaining forms of non-contagious skin disease that we meet with in our patients, viz., urticaria, gangrenous dermatitis and alopecia.

I think the majority of skin diseases may be put down as a form of dermatitis. The proximate cause of these various forms of dermatitis is hyperæmia, and every exciting cause giving rise to hyperæmia is capable of producing one or other of them, and if the tissue of the skin be weak will

necessarily be the occasion of that irritation. Local irritants acting on a susceptible skin, heat, moisture, friction, mechanical and chemical stimulants, obstructed venous circulation.

Constitutionally, disturbed nervous function, however induced, by producing disturbance of the circulation and nutrition of the skin, is amongst the commonest causes of these skin affections. We may trace the causes further to impaired digestion, pregnancy, and parturition, or to nervous shock, by which I mean the general depressing effect produced on the central nervous system by a violent stimulation of the peripheral nerves and nerve endings, and as an example of this I may mention the extremes of heat and cold.

By these foregoing remarks we are led to the conclusion that feeble digestion, assimilation and nutrition constitute a predisposing cause of general and cutaneous debility which only requires the interposition of an exciting cause to give rise to one or other of these cutaneous affections. That these diseases (at least some of them) are powerfully under the influence of the nervous system is shown by the sudden and somewhat periodic exacerbations of their symptoms, and their subsidence under the influence of agents which soothe or tranquillise the nerves.

Erythema.

The first form to which I shall call your attention is that known as erythema. This is a condition of hyperæmia and superficial inflammation usually occurring in patches, more or less extensive, sometimes with a certain amount of effusion into the deeper layers of the epidermis. It may be idiopathic or symptomatic, active or passive. This affection is not clearly seen in those animals which have deeply pigmented skin or hair. It is best seen on those parts of the body which are either devoid of hair, or where the covering of hair is but scanty or white. It is characterised by hyperæmia of the superficial papillary layer of the skin, which is manifested by intense redness. On manipulation this redness disappears on pressure and returns when the pressure is removed; there is slight heat, and the epidermis is more or less raised, scurfiness may or may not be present. The affected part is tender, and there is often a greater or lesser degree of pruritis. Various names have been given according to the change of the affected area, such as roseola and areola, but these terms are more commonly used when referring to the human subject. The chief causes are reflex irritability, due to some derangement of the digestive system, as by irritating food, &c.

External Causes.—The action of cold and heat alternately on the skin. Other causes are irritants in the form of pressure, friction, diet, moisture, lice, &c. When caused by friction of one part of the body against another it is known as erythema intertrigo; this is seen sometimes in the lips, ears (in dogs), inside of thighs, arms, and under the aspect of the tail.

When the irritation is by friction with outside objects, as with harness, or any fixed object, it is known as erythema paratrima. Mud fever is by some put down as a form of erythema, and by others as midway between erythema and the humid form of eczema. It affects the insides of the legs, thighs, and forearms of the horse. The horse may be lame from the extreme irritation and pain. It is put down as due to various causes, such as dirt moisture, leaving the legs wet on coming in from work, or through

washing off the mud and not drying the legs afterwards. In oxen it is frequently put down as being caused by certain soils. Erythema of the skin of the udder is by no means uncommon. It may be due to passive hyperæmia arising from over-distension with milk, thereby inviting friction with the legs.

Erythema may disappear very suddenly, or it may develop into an eruptive disease, or into a squamous form of inflammation if not checked.

Treatment.—Where due to an error in diet, correct this. Give less irritating food. Give laxatives. Small and regular doses of ol. lini. or magnes. sulph. for the horse. As there is frequently slight constitutional derangement with more or less pyrexia, I give saline febrifuges—potass. bicarb., pot. nit. or sodii bicarb. I like magnes. sulph. for the dog, although its use is so often condemned. External applications should also be resorted to. After the parts have been thoroughly cleansed with soap and water, a cooling lotion is indicated, such as spirit and water or diluted liq. plumbi. An excellent dressing is linimentum calcis, particularly where there is any friction. If there is much itching a weak solution of argent. nit. is very useful; or, in smaller animals, ol. eucalypti with aq. calcis. In erythema mammilaria the teats should be very carefully manipulated in milking, or it may be advisable to use a teat syphon. Remove the calf.

With regard to the treatment of mud fever, some advise that the mud be not washed off, but allowed to dry, and then be brushed off. In any case, if the legs be wetted, they should be thoroughly dried and lightly bandaged. Give laxatives and tonics. Arsenic is very useful in 2 to 4 gr. doses. In some cases it aggravates, in which case its administration should be stopped. Iron salts and diuretics are of great use. As a dressing there seems to be nothing to equal lead lotion with tr. opii or belladonna added.

Eczema—Herpes.

We now speak of the papular form of eczema, also known as herpes and lichen. It is characterised by the presence of papules or pimples. These little hard elevations are caused by distension of some of the papillæ. They may exist singly or in groups; and are usually found about the face, near the tail and on the legs, where in the horse they are often seen over the course of the flexor tendon. During the past two summers, I have had a good deal of this in my practice affecting hunters, the owners in nearly every case putting it down to pricks by the gorse. These two summers the gorse has been affected with a sticky sort of fungus; this has I think an intimate connection with the trouble, for those horses which were hunted through the gorse with bandages on did not suffer.

As the papular stage is so closely connected with the vesicular, it is often impossible to draw the line between the two, as both papules and vesicles are present together. The vesicular form is generally spoken of as eczema simplex, tetter or herpes. These small elevations are frequently arrayed over the course of certain nerves, though this is, I thing, not so often seen in our patients as in those of the medical practitioner. This stage does not as a rule last long. If successfully treated it ends in resolution, and other terminations are: moist eczema, caused by the out-pouring of the vesicular contents; by absorption of the fluid, leaving scabs: or the skin becomes hard, fissured and squamous, and rarely we may have a chronic dry tetter.

(*To be continued.*)

Obituary.

We much regret to announce the death of Mr. WILLIAM DACRE, M.R.C.V.S., of Altrincham, which took place rather suddenly in December at Colwyn Bay from bronchitis, to which he had been subject for many years.

Mr. Dacre was a pupil of the late Mr. John Lawson, of Manchester, and from there he went to Edinburgh, and was educated by the late Professor Dick, obtaining his M.R.C.V.S. in 1866; afterwards was about five years with Mr. Alec Lawson, of Bolton, until the death of that gentleman.

He then started in business at Altrincham, as he had not the strongest of constitutions, and being a nice country district his health rapidly improved. He then bought the late Mr. Roberts' practice in Manchester, and has been doing a good practice for the last fifteen years. Latterly his health broke down again, and from time to time he has had to take a sea voyage to recruit; only last summer he went to the Canary Islands, and came back much better.

He was universally respected by all who knew him, and for years was a regular attendant at all the Lancashire Veterinary Association meetings, and frequently read communications upon various subjects. He was good company, and clever in his profession; we shall all miss him.

His sister married Mr. Henderson, Chief Constable of Edinburgh.

He leaves a widow and seven children, to whom we offer our deepest sympathy in their sad affliction.

Communications, Books, Journals, &c., Received.

Veterinarian; Record; Bulletin of The John Hopkins Hospital; The Journal of Comparative Medicine and Veterinary Archives; The Scottish Medical and Surgical Journal; American Veterinary Review: The Public Health Journal; The Journal of the Jamaica Agricultural Society; Queensland Agricultural Gazette; Petersburg Veterinary Society's Journal; Revista Veterinaria (Vitoria); La Riforma Veterinaria (Naples); Recueil de Médecine Vétérinaire (Alfort); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Berliner Thierärztliche Wochenschrift (Berlin); Deutsche Thierärtzliche Wohenschrift (Hannover and Karlsruhe); La Clinica Veterinaria (Milan); La Revista Veterinaria (Buenos Aires); Agricultural Journal (Cape Town); Bulletin de la Société des Sciences (Bucarest).

The whole of the medical equipment of the American Ladies' Hospital Ship "Maine" has been contributed by Burroughs, Wellcome & Company.

We regret that, owing to great pressure, we are unable to publish this month several important communications, &c. received from contributors.